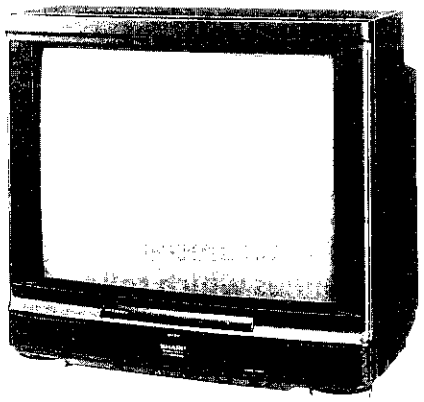
SHARP SERVICE MANUAL

S90O4SV2152U/



21 SYSTEM COLOR TELEVISION

Chassis No. 21A-M

MODEL SV-2152U

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

ELECTRICAL SPECIFICATIONS

Power Input ..... 110 — 240V AC 50/60Hz (Auto)
Power Consumption 107W
Convergence ..... Self Converging System
Focus ..... Bi-Potential, Uni-Potential Electrostatic
Sweep Deflection ..... Magnetic
Intermediate Frequencies
- Picture IF Carrier 38.9MHz
- Sound IF Carrier
  - 6.5MHz 32.4MHz
  - 6.0MHz 32.9MHz
  - 5.5MHz 33.4MHz
  - 4.5MHz 34.4MHz
- Color Sub-Carrier
  - PAL/NTSC 34.47MHz
  - SECAM 34.494/34.65MHz
  - NTSC 35.32MHz

Audio Power Output Rating ..... 2.5W × 2 (Max.)
Speaker Size ..... 8 × 4cm Oval Type × 2 pcs.

Aerial Input Impedance ..... 75 ohm Unbalanced
Receiving Channels
- PAL-B/G, SECAM-B/G
  - VHF ..... E2 thru E12
  - UHF ..... 21 thru 69
  - CATV ..... S1 thru S3, M1 thru M10 U1 thru U10
- PAL-D/K, SECAM-D/K
  - VHF ..... R1 thru R12
  - UHF ..... 21 thru 69,
- PAL-I
  - VHF ..... (IRELAND): B thru J
  - UHF ..... (U.K., H.K.): 21 thru 69
- NTSC-M
  - VHF ..... (US): 2 thru 13
    (JAPAN): 1 thru 12
  - UHF ..... (US): 14 thru 83
    (JAPAN): 13 thru 62
  - CATV ..... A-6 thru A-1, A thru W

Receiving Frequency
- VHF ..... 48.25 thru 295.25 MHz
- UHF ..... 471.25 thru 885.25 MHz

Specifications are subject to change without prior notice.

WARNING

The chassis in this receiver is partially hot. Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis.
To prevent electric shock, do not remove cover. No user — serviceable parts inside. Refer servicing to qualified service personnel.

CONTENTS

	Page
• ELECTRICAL SPECIFICATIONS	1
• IMPORTANT SERVICE SAFETY PRECAUTION	2
• SERVICE INSTRUCTION	4
• SERVICE ADJUSTMENT	5
• TROUBLE SHOOTING TABLE	17
• CHASSIS LAYOUT DIAGRAM	22
• PRINTED WIRING BOARD ASSEMBLIES	23
• SCHEMATIC DIAGRAMS AND WAVEFORMS	28
• BLOCK DIAGRAM	35
• REPLACEMENT PARTS LIST	39

IMPORTANT SERVICE SAFETY PRECAUTION

■ **Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and servicing guidelines which follow:**

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulation material. The non-isolated (hot) ground system is for the +B voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low +B DC voltages and the secondary cicuit of the high voltage transformer.
   To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation if the high voltage is as specified in the "High Voltage Check" instructions. It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen are available at all times an accurate high voltage meter.
   The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value —no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and, also, under certain conditions, may produce radiation in excess of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver. Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION
(Continued)

BEFORE RETURNING THE RECEIVER
(Fire & Shock Hazard)

Before returning the receiver to the user, perform the following safety checks.

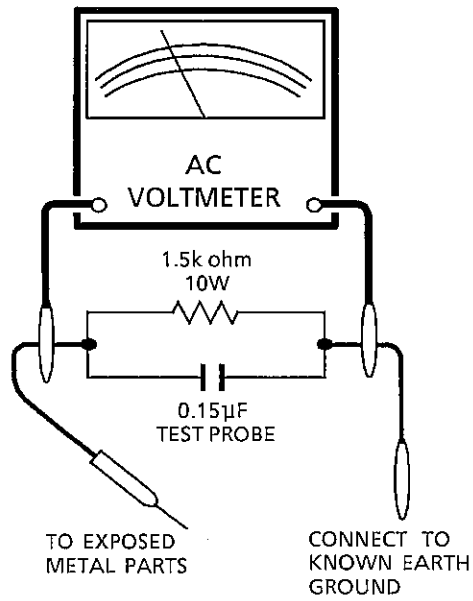
1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.

- Plug the AC cord directly into a 120 volt AC outlet, (Do not use an isolation transformer for this test).
- Using to clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
- Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.
- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

  All check must be repeated with the AC line cord plug connection reversed. (IF necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)

  Any current measured must not exceed 0.5 milliamp.

  Any measurements not within the limits outlined above are indicative of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics.

These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by " ⚠ " and shaded areas in the ***Replacement Parts Lists*** and ***Schematic Diagrams***. For continued protection, replacement parts must be identical to those used in the original circuit. The use of a substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdriver or TV alignment tools.
(2) Before performing adjustment, TV set must be on at least 15 minutes.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, or +B system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 264V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Turn the user Contrast control and the user Brightness control to the minimum. (The screen becomes dark.)
4. Be sure that the voltage at test point TP603 (D612 cathode) is approx. 19.7V.
5. Apply the external voltage of 24V toTP603 (D612 cathode) and be sure that the unit becomes OFF (stand-by) state, that is, the horizontal oscillation of the unit is stopped by the X-RAY protector circuit.
6. Be sure that after disconnecting the external power source.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode.
2. Operate receiver for at least 15 minutes at 264V AC line voltage, with strong air signal or properly tuned in test signal.
3. Turn the user Contrast control and the user Brightness control to the minimum.
4. Be sure that the high voltage is approx. 28.8kV.

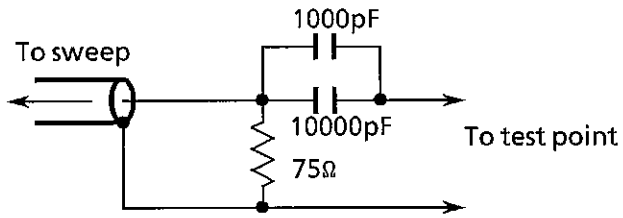
SERVICE ADJUSTMENT

PIF/AFT/SIF/AGC ADJUSTMENT

TUNER IFT COILS

The tuner has been factory preset (no adjustment is needed).

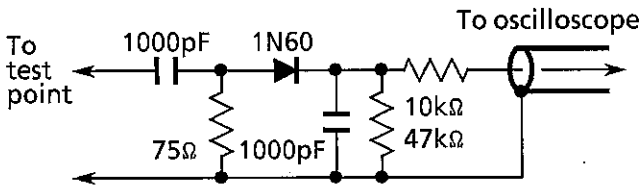
1. Set V_T voltage at 5V in V_H band.
2. Connect sweep generator's output to the test point of tuner, by using a *75Ω DC cut probe*.



Connection Diagram of 75Ω DC Cut Probe.

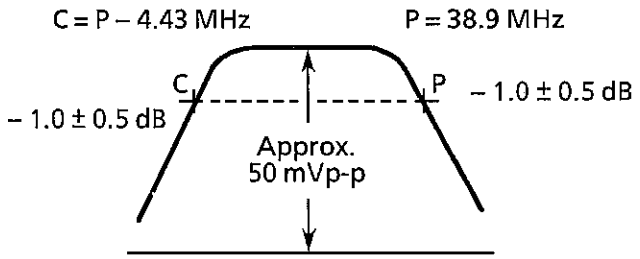
* **NOTE:**
The sweep generator's probe should be grounded closely to the tuner test point.

3. Output level of sweep generator: 80 dB
4. Connect response lead (*low impedance probe with detector*) to the collector of Q1201 (in IF unit).



Connection Diagram of Low Impedance Probe (with Detector).

5. PIF AGC:
   Apply DC 4.5V to pin (1) of IC1201 (in IF unit).
6. RF AGC:
   Apply DC 4.0V (about – 20dB) to the tuner AGC terminal.
7. Connect 10k ohm resistor between base of Q203 and 12V line.
8. Adjust the tuner IF coils to obtain the waveform as shown figure below.
   NOTE:
   For the adjustment, keep the tuner covered with its lid.

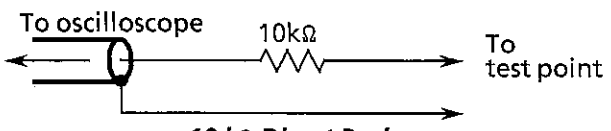


Adjust so that "P"and "C" are at the same level.

P-DETECTOR COIL: T1202

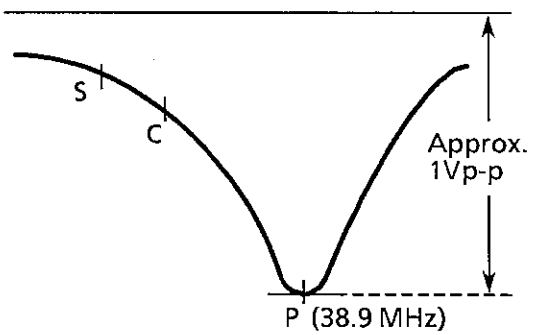
This coil (in IF unit) has been factory preset (no adjustment is needed).

1. Connect sweep generator's output to pin (5) of IC1201.
   - Probe in use: 75Ω DC cut probe
   - Sweep output level: 90 dB
2. PIF AGC:
   Apply 4.5V DC to pin (1) of IC1201.
3. Have AFT muted.
   AFT is muted if pin (2) of IF unit is grounded.
4. Connect response lead to TP401.
   The response lead in use should be a direct probe with a resistor of 10k ohms included.



10 kΩ Direct Probe.

5. Adjust T1202 so that 38.9 MHz signal is at maximum (± 50 kHz).

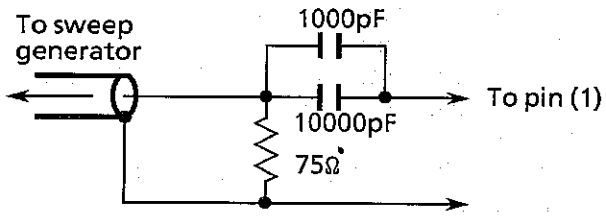


* Adjust PIF AGC voltage so that the output waveform is of approx. 1 Vp-p.

PIF/AFT/SIF/AGC ADJUSTMENT (Continued)

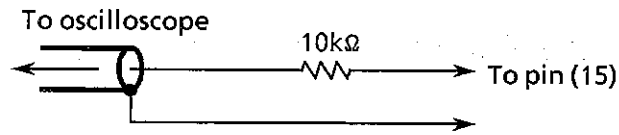
AFT COIL ROUOGH ADJUSTMENT: T1201

1. Connect sweep generator's output to pin (14) of IF unit.
   - Probe in use: 75Ω DC cut probe
   - Sweep output level: 70 dB

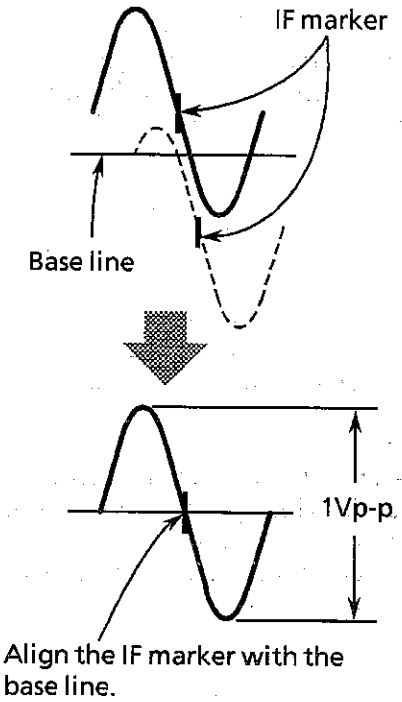


Connection Diagram of 75Ω DC Cut Probe.

2. Apply 4.5V DC (PIF AGC) to TP1203 (pin (1) of IC201).
3. Connect response lead to pin (1) of IF unit. (The response lead should be a direct probe with a 10k ohm resistor included.)
   - Tune off AFT Mute.



4. Adjust T1201 to align the marker with the base line.



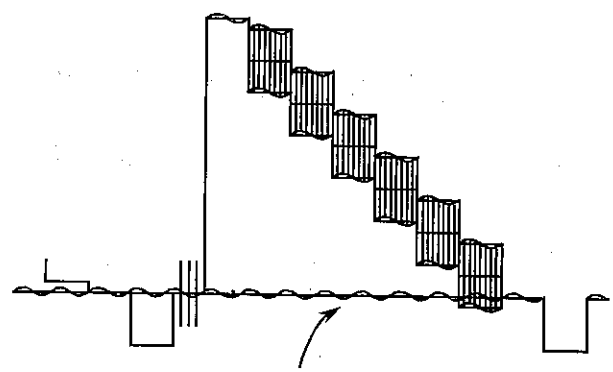
Align the IF marker with the base line.

- Adjust the sweep generator's sweep range to obtain normal S-curve on the oscilloscope screen.
- Adjust the IF AGC voltage so that the S-curve's amplitude be approx. 1Vp-p.

AFT COIL: T1201

Before this adjustment, the AFT coil (rough adjustment) must have been completed.

1. Receive "PAL COLOR BAR" signal with color bar generator.
   - Signal strength: Over 55dB, Below 80dB
2. Connect oscilloscope to TP401.
   - Oscilloscope range: 0.5 V/DIV
   - Sweep time: 20 µsec/DIV
   - Synchronization: Horizontal sync.
3. Connect the output of SSG (Standard Signal Generator) to the tuner IF output terminal across a capacitor of 1pF.
   - SSG output frequency:
     38.9 MHz (CW)
     38.9 MHz ± 5 kHz
   - SSG output level: approx. 50 dB
4. Adjustment error: 38.900 MHz ± 25 kHz.
   * When the preset switch is set at U or V position, AFT is turned off.
5. Set the preset switch at V position and adjust FINE button (Up or Down) of tuning control so that the output waveform suffers no beating.
6. Set the preset switch at NORMAL position.
7. Adjust T1201 so that no beating is caused at the output waveform.

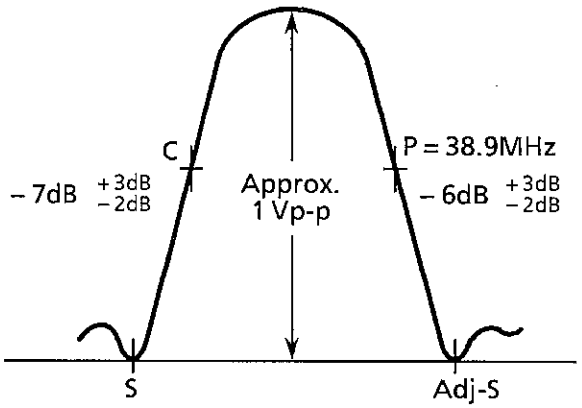


Finely adjust to make zero the beating

PIF/AFT/SIF/AGC ADJUSTMENT (Continued)

PIF OVERALL WAVEFORM

1. Set V_T voltage at 5V in V_H band.
2. Connect sweep generator's output to the test point of tuner.
   - Probe in use: 75Ω DC cut probe
   - Sweep output level: 70dB
3. Connect response lead to TP401.
   The response lead in use should be a direct probe with a resistor of 10k ohms included.
4. RF AGC:
   Apply approx. 4.0V DC to the tuner AGC terminal.
5. PIF AGC:
   Apply approx. 4.5V DC to pin (1) of IC1201 in IF unit.
6. Connect a 120 ohm damping resistor in parallel to R1213 (in IF unit).
   NOTE:
   Cut the resistor's leads as short as possible.
7. Turn off AFT:
   AFT is turned off if pin (4) of IC1201 in IF unit is grounded.
8. Adjust IF AGC voltage so that the output waveform is of approx. 1Vp-p.
9. Check that the overall waveform is as shown in Figure below.

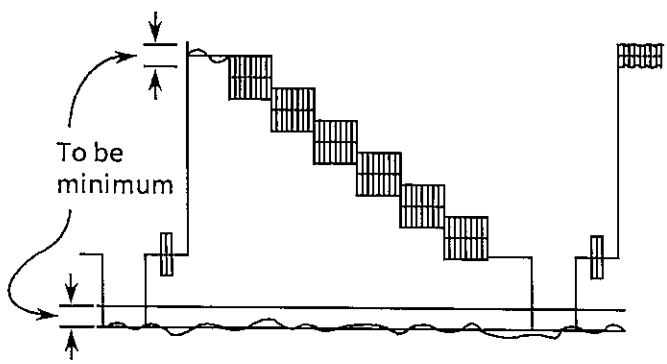


RF-AGC CUT-IN CONTROL: R218

1. Receive "PAL COLOR BAR" signal with color bar generator.
   - Signal strength: 53dB ± 1dB (with 75Ω terminated)
2. Connect DC voltmeter to the tuner AGC terminal (TP201).
   (Full scale: 10V)
3. Turn R218 so that the voltmeter reads the maximum output.
4. Slowly turn R218 in the opposite direction until the voltmeter begins to decrease its reading; then stop turning of R218.
5. Set the signal strength at 65dB ± 2dB, and check that no noise appears.
6. Receive "MONOSCOPE PATTERN" signal, and check that no noise appears.
   - Signal strength: 65dB ± 2dB
7. Set the signal strength at 90dB to 95dB and check that there appears no crossmodulation beating.
   - AGC control value: 53dB ± 1dB. (with 75Ω terminated)

"NTSC" 4.5MHz TRAP: T201

1. Receive "NTSC COLOR BAR" signal with color bar generator.
   - Signal strength: Over 55dB, Below 80dB.
2. Connect oscilloscope to TP401.
   - Voltage range: 0.5V/div.
   - Sweep time: 20μsec/div.
   - Synchronization: Horizontal sync.
3. Adjust T201 so that the oscilloscope waveform's 920kHz beat be minimum.



PIF/AFT/SIF/AGC ADJUSTMENT (Continued)

SOUND DETECTOR COIL: T1301

This coil (in IF unit) has been factory preset (no adjustment is basically needed).

1. Connect SSG output to pin (16) of IC1201.
   - The probe in use should be a 75Ω DC cut probe.
   - SSG output level: 80dB (5.5 MHz CW)
2. IF AGC:
   Apply 4.5V DC to pin (1) of IC1201.
3. Connect DC voltmeter to pin (9) of IC1201.
   (Full scale: 10V)
4. **AUDIO-MUTE ON:**
   Have pin (4) of IF unit grounded, and read the value then available on the voltmeter (VTVM). It should be approx. 4.5V.
5. **AUDIO-MUTE OFF:**
   Remove the grounding at pin (4) of IF unit.
6. Adjust T301 so that the voltmeter indicates the same value as in step 4 above.

AUDIO MUTE CHECKING

1. Receive "PAL COLOR BAR" signal.
2. Set the Sound control at maximum position.
3. Stop reception of "PAL COLOR BAR" signal.
   (Pull out the antenna)
4. Check that no output of 400 Hz signal is heard from the speaker.

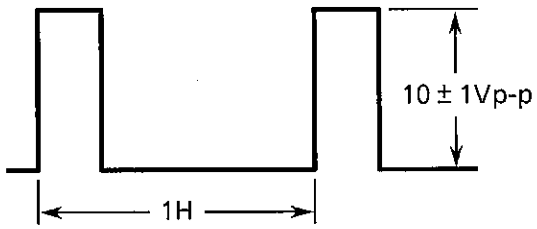
VIDEO CIRCUIT ADJUSTMENT

CRT CUT-OFF ADJUSTMENT

- R853: Red Bias control
- R859: Green Bias control
- R865: Blue Bias control
- Screen control (a part of T602)
- R857: Green Drive control
- R863: Blue Drive control

*** Note:**
Prior to this adjustment, warm up the unit with the beam current of more than 700μA for more than 30 minutes.

1. Receive "MONOSCOPE PATTERN" signal with pattern generator.
2. Set Red Bias control at MIN position.
   Set Green Bias control at MIN position.
   Set Blue Bias control at MIN position.
   Set Green Drive control at CENTER position.
   Set Blue Drive control at CENTER position.
3. Turn the "N" key on the remote controller.
4. Set the Screen control at MIN position.
5. Connect the oscilloscope to TP852 (red cathode).
6. Turn S401 (service switch) at the horizontal line position.
7. Adjust Sub-Brightness control R425 to obtain a blanking pulse level of 10 ± 1Vp-p at TP852.



8. Disconnect the oscilloscope fromTP852.
9. Slowly turn the Screen control clockwise until the horizontal raster appears slightly, and stop it.
10. Here, one of the three colors (red, blue, green) appears first as the Screen control is turned. So, touching off the Bias control belonging to the first color, use and move the other two controls so that the horizontal raster becomes white.
11. Turn the Screen control counterclockwise until the horizontal raster disappears, and stop it.

WHITE BALANCE AND BACK GROUND

- R857: Green Drive control
- R863: Blue Drive control
- R436: Sub Contrast control

*** Note:**
Prior to this adjustment, warm up the unit with the beam current of more than 700μA for more than 30 minutes.

1. Receive "MONOSCOPE PATTERN" signal with pattern generator..
2. Set the Contrast control and Brightness control at MAX position.
3. Connect ammeter to TP601 and TP602.
   (Full scale: 3 mA)
4. Adjust Sub-Contrast control so that the beam current becomes 1.1 mA (rough adjustment).
5. Adjust Green Drive control and Blue Drive control so that the color temperature is at 9300°K. (High beam: 0.8 mA).
6. Adjust the Contrast control and Brightness control so that the beam current is approx. 200μA, and check that the color temperature is at 9300°K. If the temperature is not at 9300°K, go back to "CRT CUT-OFF ADJUSTMENT" and repeat the adjustment.
   (X = 0.285, Y = 0.292)

SUB-CONTRAST CONTROL: R436

*** Note:**
Prior to this adjustment, warm up the unit with the beam current of more than 700μA for more than 30 minutes.

1. Receive "MONOSCOPE PATTERN" signal with pattern generator..
2. Set the Contrast and Brightness controls at MAX position.
3. Connect beam ammeter to TP601 (−) and TP602 (+).
   (Full scale: 3 mA)
4. Adjust Sub-Contrast control so that the beam current becomes 1.1 mA.

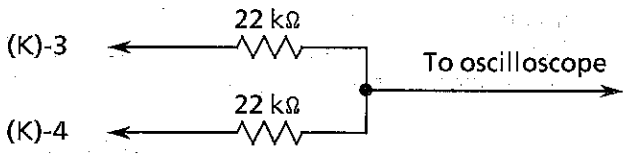
CHROMA CIRCUIT ADJUSTMENT "PAL"

PAL CHROMA ADJUSTMENT

- R806: 1H-delay amp. control
- T801: 1H-delay phase control

Note: PIF/AFT/AGC adjustments should have been completed before starting this adjustment.

1. Receive the "PAL COLOR BAR" signal with color bar generator.
2. Connect the following resistance matrix to pins 3 and 4 of the connector (K), to which an oscilloscope is connected.



Resistance Matrix

3. Set service switch S401 at the Video Cut position to cut-off the Y-signal.
4. Turn on the "N" key the remote controller.
5. Adjust the Color control key of the remote controller so that the output waveform of color difference signal becomes 2.5Vp-p.
6. Adjust 1H-delay amp. control (R806) and 1H-delay phase control (T801) so that the output waveform shown in Fig. ***a*** is corrected to that shown in Fig. ***b***.
7. Return S401 to CENTER position.

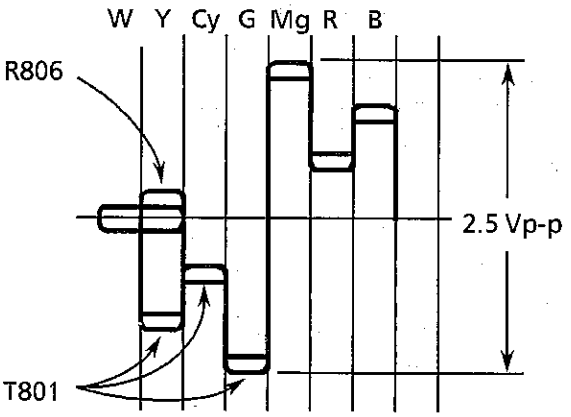


Figure a. Waveform before the adjustment

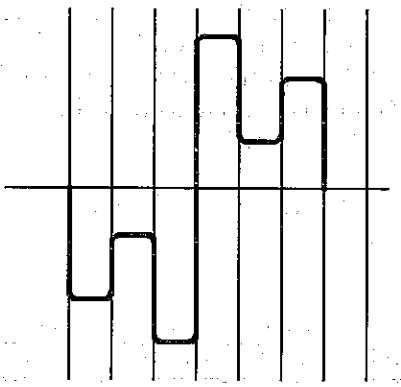
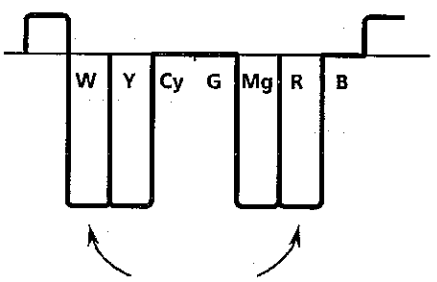


Figure b. Waveform after the adjustment

PAL SUB-COLOR ADJUSTMENT: R802

1. Receive the "PAL COLOR BAR" signal with color bar generator.
2. Turn on the "N" key on the remote controller.
3. Connect oscilloscope to the TP852 (red cathode).
   - Voltage Range: 20V/div.
   - Sweep time: 20μsec/div.
4. Adjust R802 so that the white signal (75%) and red signal have the same level.

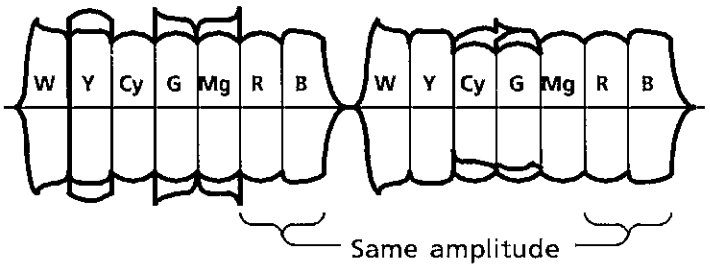


Same level for the white and red outputs.

CHROMA CIRCUIT ADJUSTMENT "SECAM"

BELL FILTER ADJUSTMENT: T903

1. Receive "SECAM COLOR BAR" signal with color bar generator.
2. Connect the oscilloscope to TP901 with the following settings.
   - Voltage Range: 0.05 V/div., AC
   - Sweep Time: 20µsec/div.
   - Probe: 1/10 (30pF, 10MΩ or more)
3. Adjust the Bell Filter (T903) so that the Red and Blue portions of the color bar signal should have the same amplitude.



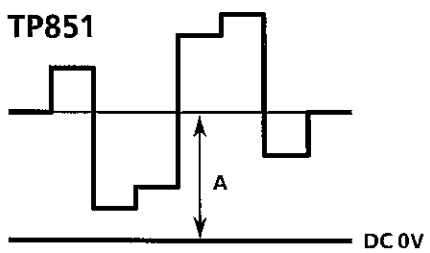
SECAM KILLER ADJUSTMENT: T904

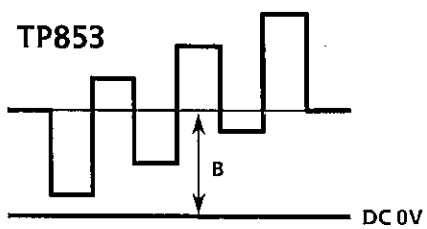
1. Receive "SECAM COLOR BAR" signal with color bar generator.
2. Connect the oscilloscope to TP902 with the following settings.
   - Voltage Range: 1V/div., DC
     (Adjust vertical position properly.)
   - Sweep Time: 20 µsec/div.
3. Adjust T904 to obtain maximum DC voltage (approx. 10V) at TP902.

B-Y (T901), R-Y (T902) DISCRIMINATOR ADJUSTMENT

Note: Connect a 0.001µF capacitor to TP851 and TP853 respectively to filter out interference noise.

1. Receive "SECAM COLOR BAR" signal with color generator.
2. Connect the oscilloscope (with two channels) to TP851 (R-Y) and the TP853 (B-Y), both located on the CRT Socket Unit (**PWB-B**) of the set.
   - Voltage Range: 2V/div., DC
   - Sweep Time: 10 µsec/div.
3. Set service switch S401 at the Video Cut position to cut-off the Y-signal.
4. Set both the Contrast and Brightness controls to their maximum positions.
5. Adjust T901 and T902 so that the DC output levels obtained when the color control is set to minimum (black and white level) and those when set to 100% color saturation become the same.
6. Return S401 to CENTER position.

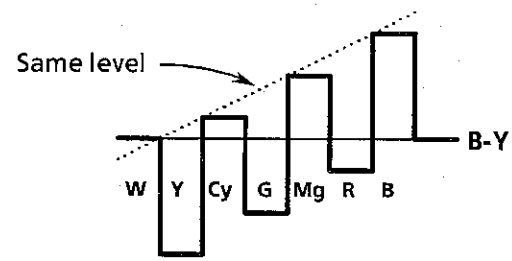




CHROMA CIRCUIT ADJUSTMENT "NTSC"

SUB-HUE: R835

1. Receive "NTSC COLOR BAR" signal with color generator.
2. Connect the oscilloscope to TP853 (B-Y).
3. Turn on the "N" key on the remote controller.
4. Set service switch S401 at the Video Cut position to cut-off the Y-signal.
5. Operating the Color control key on the remote controller, adjust the B-Y waveform to approx. 3Vp-p.
6. Adjust Sub-Hue control R835 so that the waveform is obtained.
7. Return S401 to CENTER (normal) position.

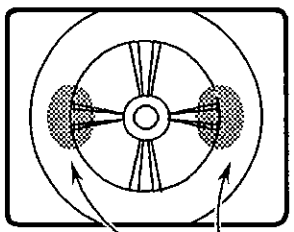


ADJUSTMENT OF DEFLECTION LOOP

Note: During the adjustment, keep the unit facing the east.

FOCUS ADJUSTMENT

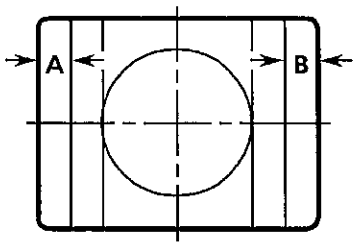
1. Receive "MONO SCOPE PATTERN" signal.
2. Set Contrast and Brightness controls at CENTER position.
3. Adjust Focus control to have best focus at the central area of CRT.



HORIZONTAL CENTERING CONTROL: R602

This adjustment should be performed after the purity and convergence adjustments.

1. Receive "MONO SCOPE PATTERN" signal.
2. Adjust R602 so that the horizontal center of picture is at the position which gives the relation of **A = B**.



VERTICAL LINEARITY CONTROL: R526

1. Receive "MONO SCOPE PATTERN" signal.
2. Adjust R526 so that the vertical linearity of picture is at best point.

VERTICAL SIZE CONTROL: R503

1. Receive "MONO SCOPE PATTERN" signal.
2. Set the Brightness and Contrast controls at maximum position.
3. Adjust R503 so that the vertical size of picture is at best point.
   - Vertical size: 8% TYP (Max. 10%)

VERTICAL CENTERING CONTROL: S501

This adjustment should be performed after the purity and convergence adjustments.

1. Receive "MONO SCOPE PATTERN" signal.
2. Adjust S501 so that the vertical center of picture is at the geometrical center of screen.

PURITY ADJUSTMENT

Note: During the adjustment, keep the unit facing the east.

PURITY ADJUSTMENT

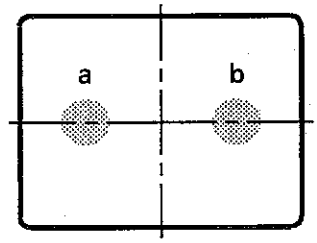
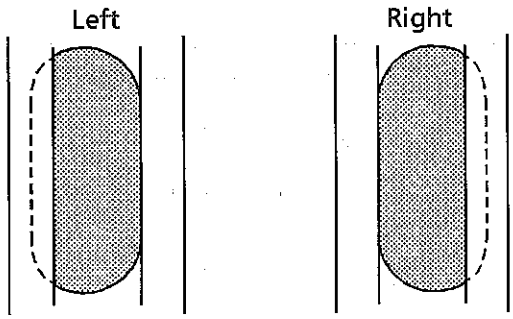
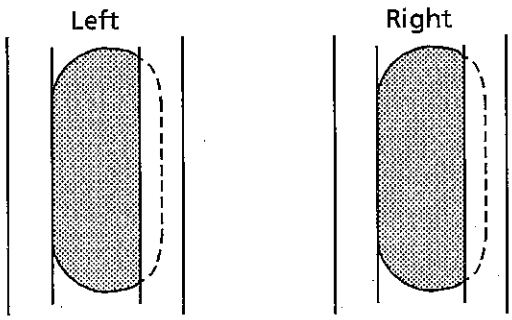


Figure A.



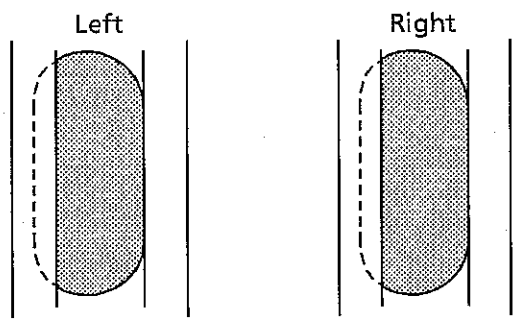
The beam landing is shifted outwards.

Figure B.



The beam landing is shifted to right.

Figure C.



The beam landing is shifted to left.

Figure D.

1. Prior to the purity adjustment, warm up the unit with beam current of more than 700 μA, for more than 30 minutes.
2. Receive the green signal alone and adjust the beam current to approx. 770 μA.
3. Fully degauss the CRT with the degaussing coil.
4. Before the purity adjustment, it is needed to roughly adjust the static convergence.
5. Set the purity magnet at the position which gives zero (0) magnetic field.

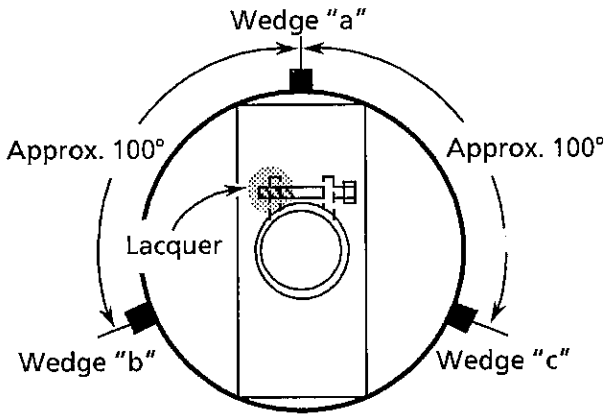
Adjustment

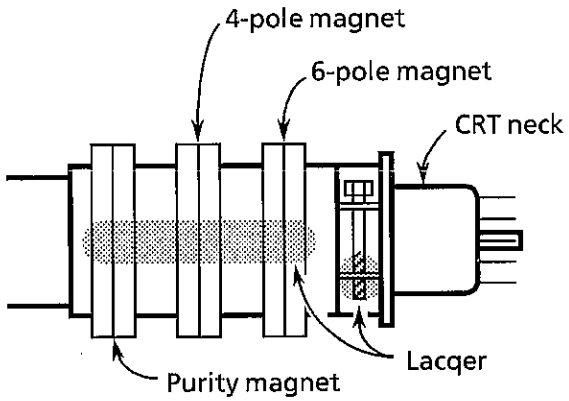
6. Observe the green spots ("**a**" and "**b**") with a microscope as shown ***Fig. A***, and adjust the purity magnet so that they are at the specified landing position.
7. If the right and left green spots are both deviated outwards from their landing positions as shown in ***Fig. B,*** push the deflection yoke forwards until their positions are corrected.
8. If the beam landing is shifted to right or left as shown in ***Figs. C*** and ***D***, adjust the opening degree of the purity magnet so that the beam landing is correctly positioned.
9. Adjust the purity magnet so that the beam landing is correct at either of the central part, right and left parts of screen, then check that the green beams at four corners of screen are all correctly positioned.
   Finally, check that the beam landing at any pat of screen is satisfactory with the Rank "B" specifications.
10. If the green beam is positioned to mix with the other color, pull the deflection yoke backward.
    - Outside of the specified landing:
      To front of the deflection yoke.
    - Inside of the specified landing:
      To back of the deflection yoke.
11. Set the raster rotation at "0" position (with the unit facing the east).
12. Tighten the screws of the deflection coil.
    Tightening torque: 11 kg ± 2 kg.

CONVERGENCE ADJUSTMENT

Note: During the adjustment, keep the unit facing the east.

CONVERGENCE ADJUSTMENT





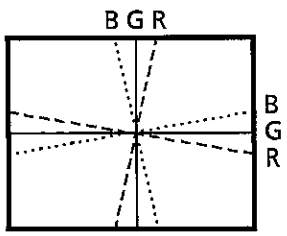


Figure a.

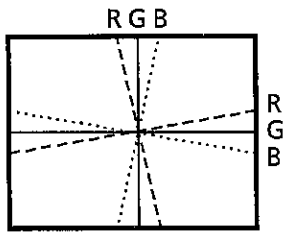


Figure b.

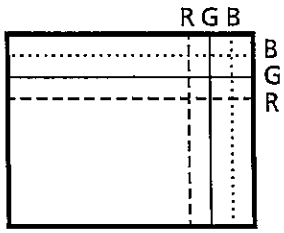


Figure c.

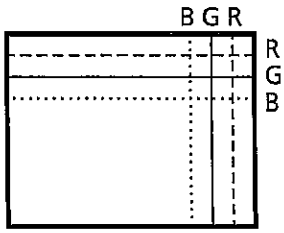


Figure d.

This adjustment should be performed after the purity magnet adjustment.

1. Receive "CROSSHATCH PATTERN" signal.
2. Set the Brightness control and Contrast control at MAX position.

STATIC CONVERGENCE

3. Adjust the opening degree of the 4-pole magnet and rotate the magnet to converge red and blue lines.
4. Adjust the opening degree of the 6-pole magnet and rotate the magnet to converge red, blue and green lines.

DYNAMIC CONVERGENCE

5. Dynamic convergence (convergence of the three colour fields) at the edges of CRT screen is accomplished in the following manner.

Convergence in *Fig. a*:
Insert wedge"a" between the deflection yoke and CRT, and tilt the deflection yoke upward until the mis-convergence shown in ***Fig. a*** is corrected.

Convergence in *Fig. b*:
Insert wedges "b" and "c" between the deflection yoke and CRT, and tilt the deflection yoke until the mis-convergence shown in ***Fig. b*** is corrected.

Convergence in *Fig. c*:
Insert wedge "c" deeply between the deflection yoke and CRT, and tilt the deflection yoke to right until the mis-convergence shown in ***Fig. c*** is corrected.

Convergence in *Fig. d*:
Insert wedge "b" deeply between the deflection yoke and CRT, and tilt the deflection yoke to left until the mis-convergence shown in ***Fig. d*** is corrected.

6. Stick the three wedges onto the CRT, and apply glass tapes thereon.
7. Apply lacquer to the deflection yoke screw, magnet unit (made of purity, 4-pole and 6-pole magnets) and magnet unit screw.

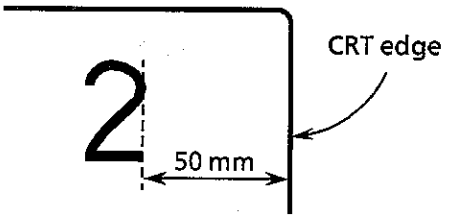
After the adjustment, receive either the Red or the Blue signal and check that there is no mixture with the other color signal.

CRT DISPLAY ADJUSTMENT

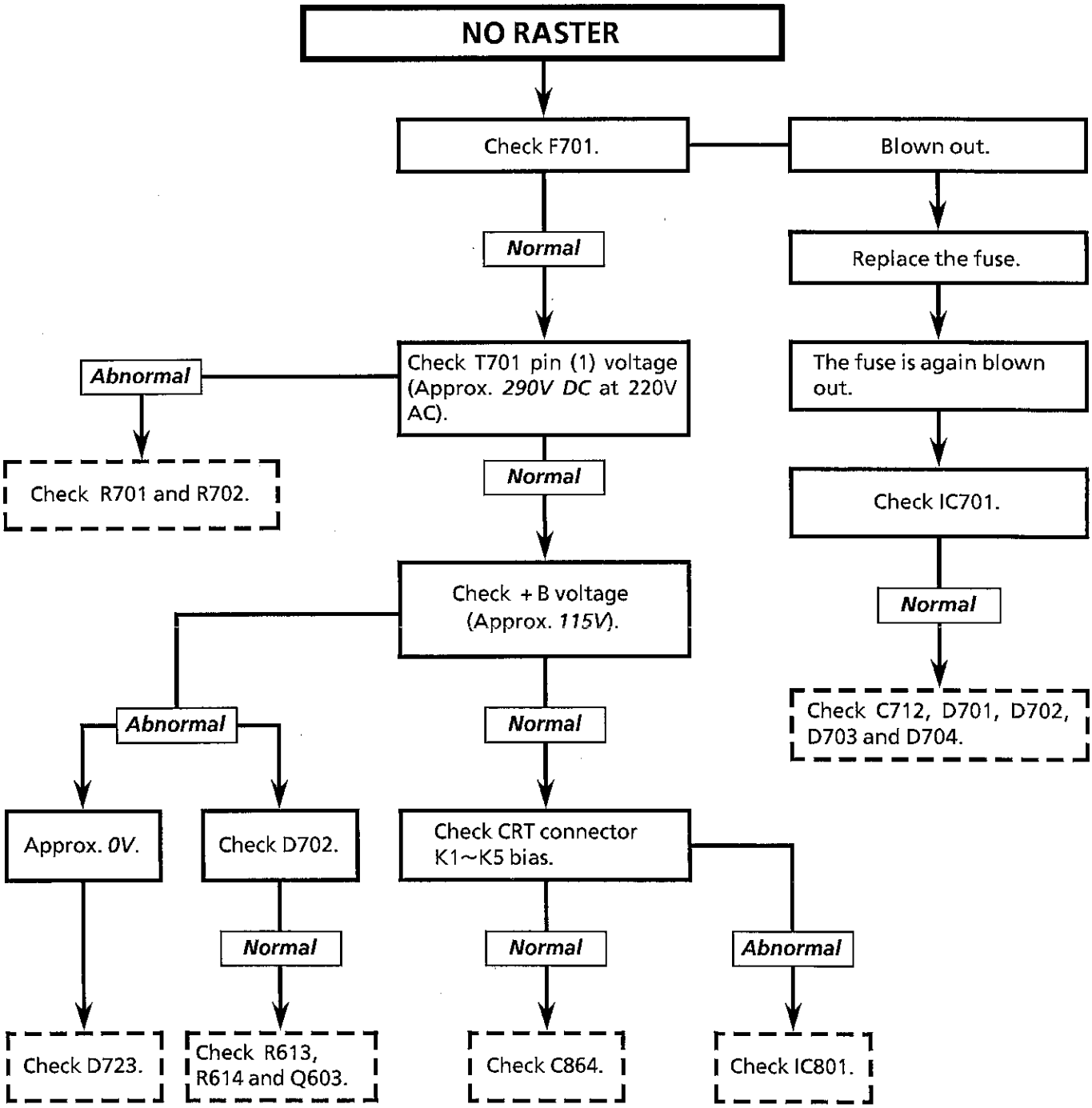
Note: During the adjustment, keep the unit facing the east.

SIGN POSITION CONTROL: R1017

1. Set the channel number at 2.
2. Display the channel sign by means of the channel call of remote control on the screen.
3. Adjust the sign position by R1017 so that it is set 50 mm away from the CRT edge.

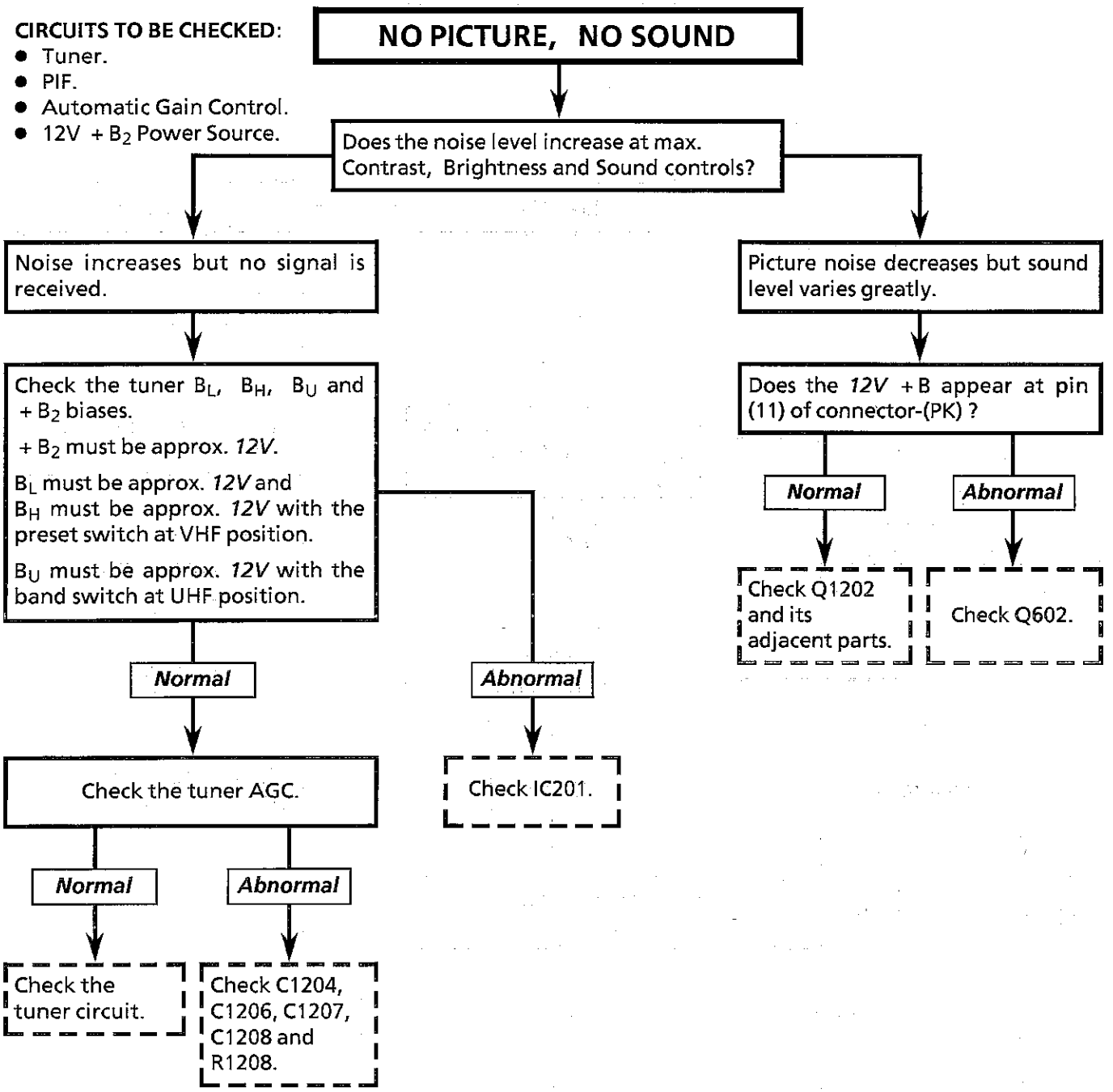


TROUBLE SHOOTING TABLE

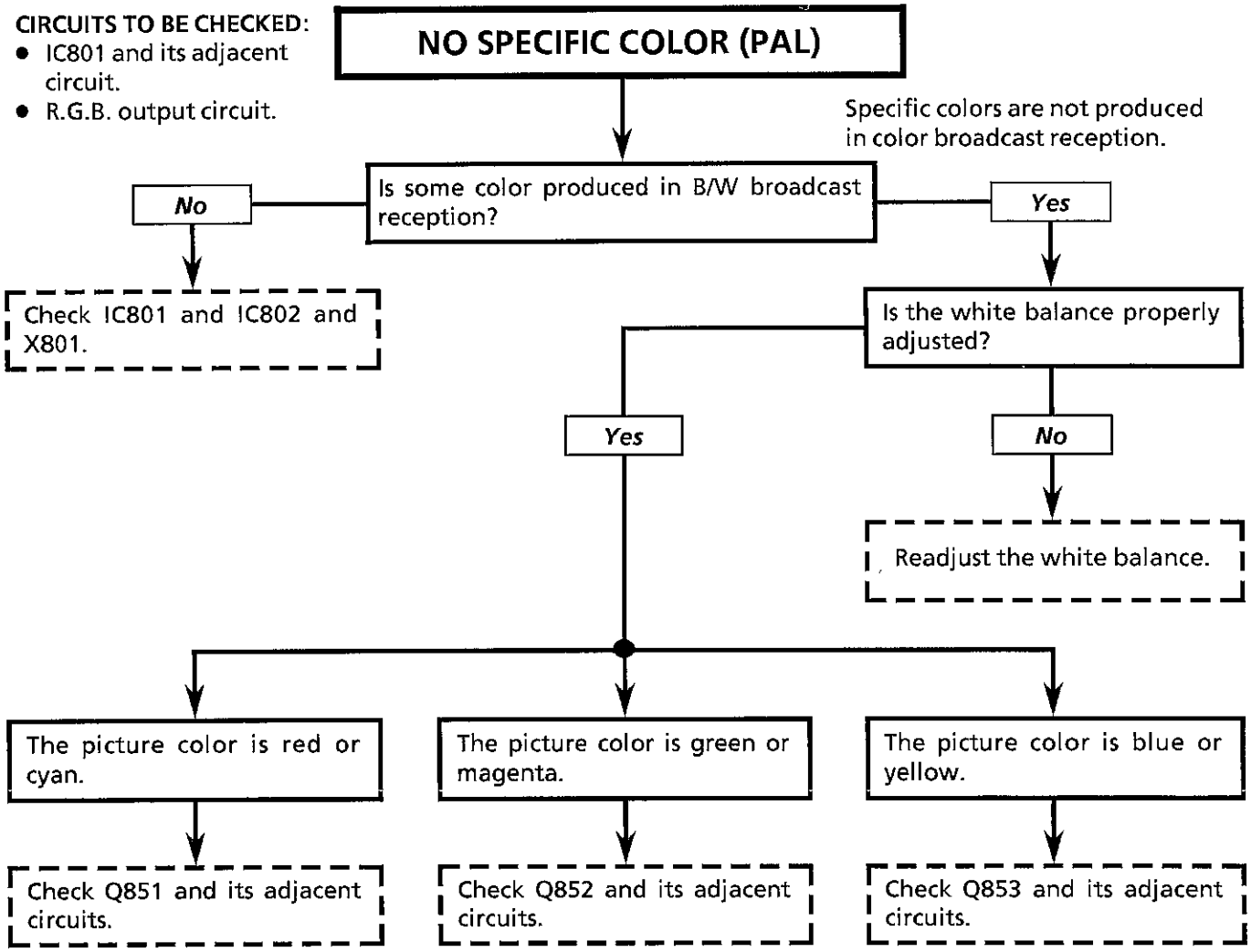


CIRCUITS TO BE CHECKED:

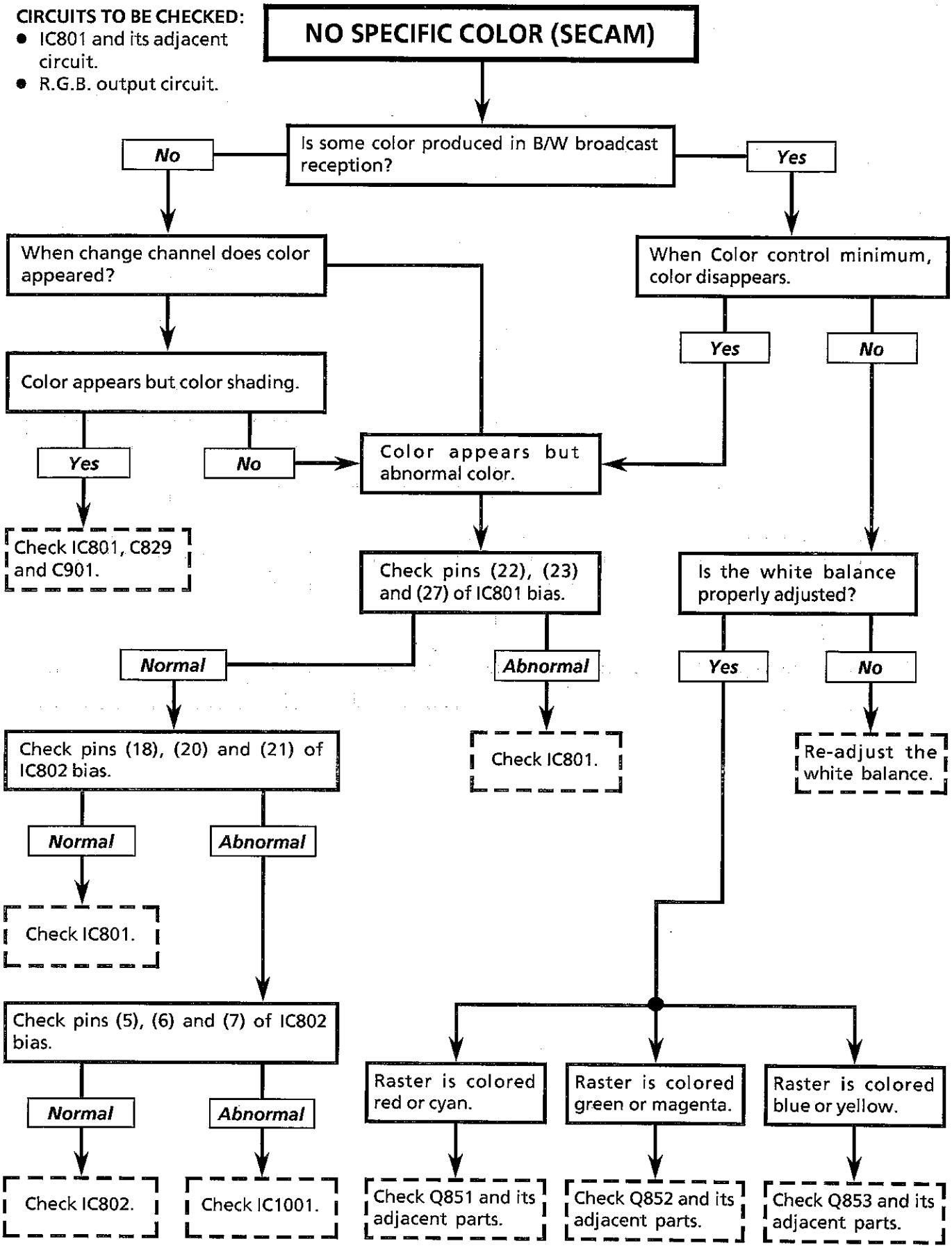
- Tuner.
- PIF.
- Automatic Gain Control.
- 12V + B_2 Power Source.


NO PICTURE, NO SOUND
Does the noise level increase at max. Contrast, Brightness and Sound controls?
Noise increases but no signal is received.
Picture noise decreases but sound level varies greatly.
Check the tuner B_L, B_H, B_U and + B_2 biases.
+ B_2 must be approx. 12V.
B_L must be approx. 12V and B_H must be approx. 12V with the preset switch at VHF position.
B_U must be approx. 12V with the band switch at UHF position.
Does the 12V + B appear at pin (11) of connector-(PK) ?
Normal
Abnormal
Normal
Abnormal
Check Q1202 and its adjacent parts.
Check Q602.
Check the tuner AGC.
Check IC201.
Normal
Abnormal
Check the tuner circuit.
Check C1204, C1206, C1207, C1208 and R1208.

CIRCUITS TO BE CHECKED:
- IC801 and its adjacent circuit.
- R.G.B. output circuit.


NO SPECIFIC COLOR (PAL)
Specific colors are not produced in color broadcast reception.
Is some color produced in B/W broadcast reception?
No
Yes
Check IC801 and IC802 and X801.
Is the white balance properly adjusted?
Yes
No
Readjust the white balance.
The picture color is red or cyan.
The picture color is green or magenta.
The picture color is blue or yellow.
Check Q851 and its adjacent circuits.
Check Q852 and its adjacent circuits.
Check Q853 and its adjacent circuits.

CIRCUITS TO BE CHECKED:
- IC801 and its adjacent circuit.
- R.G.B. output circuit.



CIRCUITS TO BE CHECKED:
- IC801 and its adjacent circuit.
- R.G.B. output circuit.

NO SPECIFIC COLOR (NTSC)

Specific colors are not produced in color VCR NTSC4.43 reception.

Is some color produced in B/W broadcast reception?

No

Check IC801, IC802, Q807, X801 (NTSC 4.43MHz) and X802 (NTSC 3.58MHz) .

Yes

Is the white balance properly adjusted?

No

Readjust the white balance.

Yes

The picture color is red or cyan.

Check Q851 and its adjacent circuits.

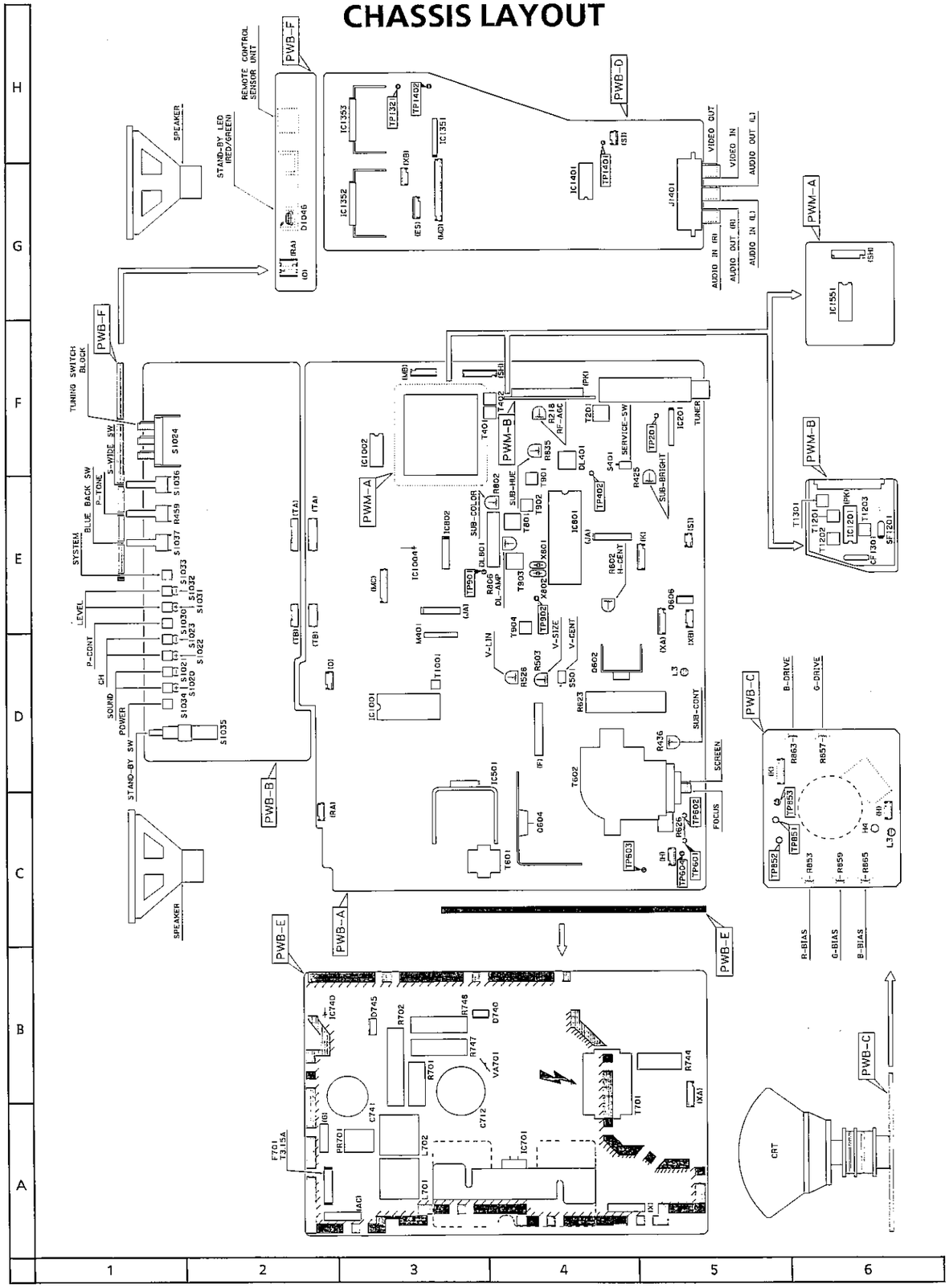
The picture color is green or magenta.

Check Q852 and its adjacent circuits.

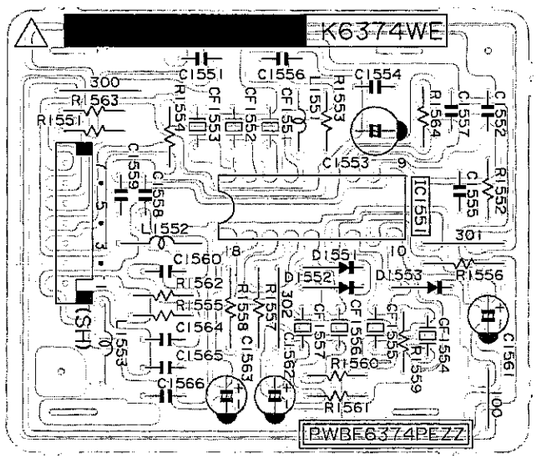
The picture color is blue or yellow.

Check Q853 and its adjacent circuits.

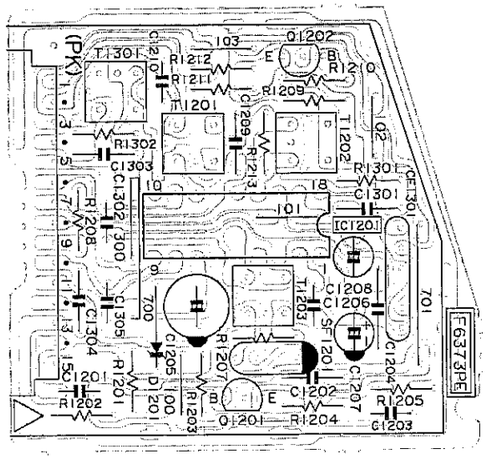
CHASSIS LAYOUT



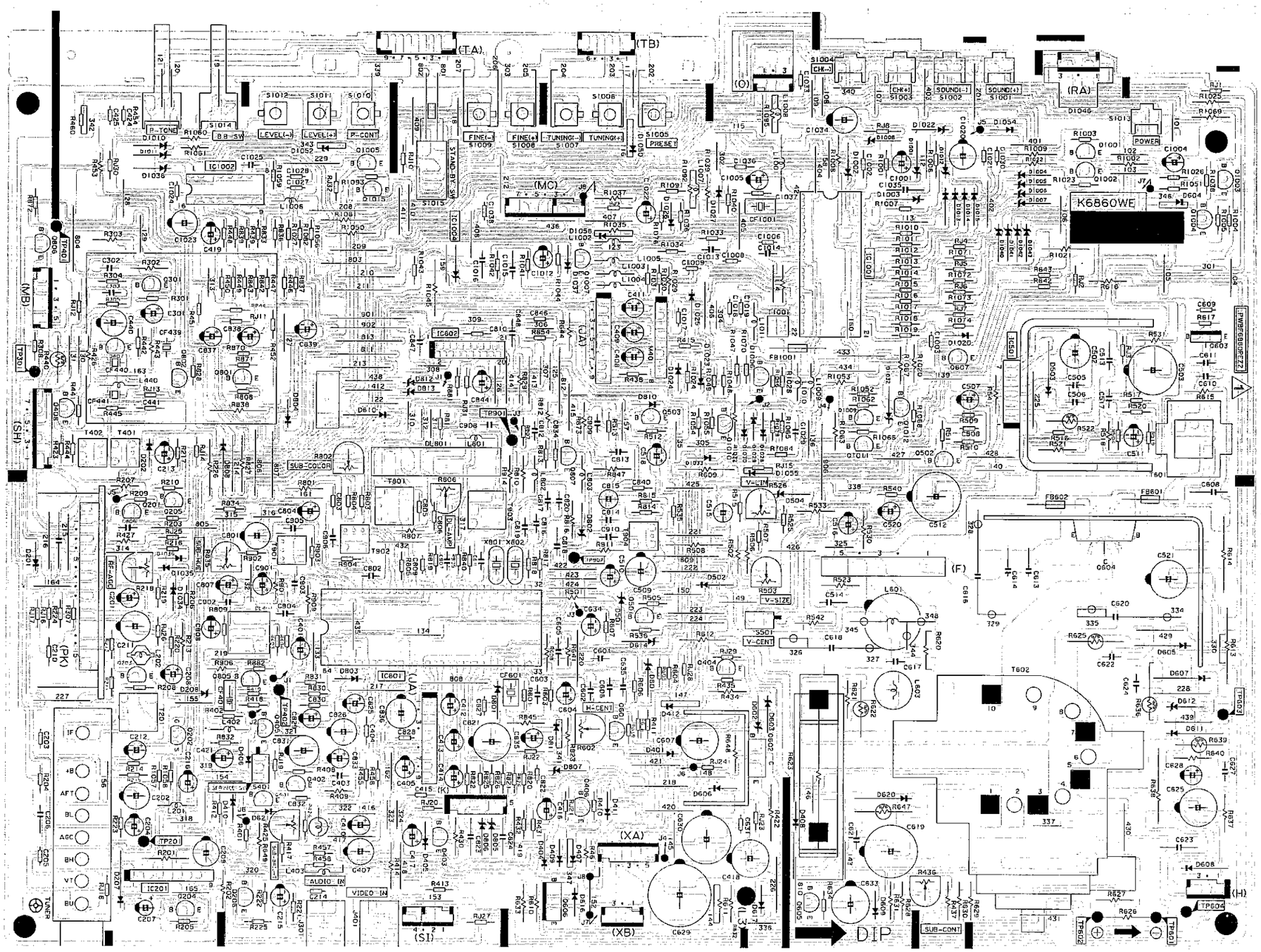
PRINTED WIRING BOARD ASSEMBLIES



PWM-A Wiring Side

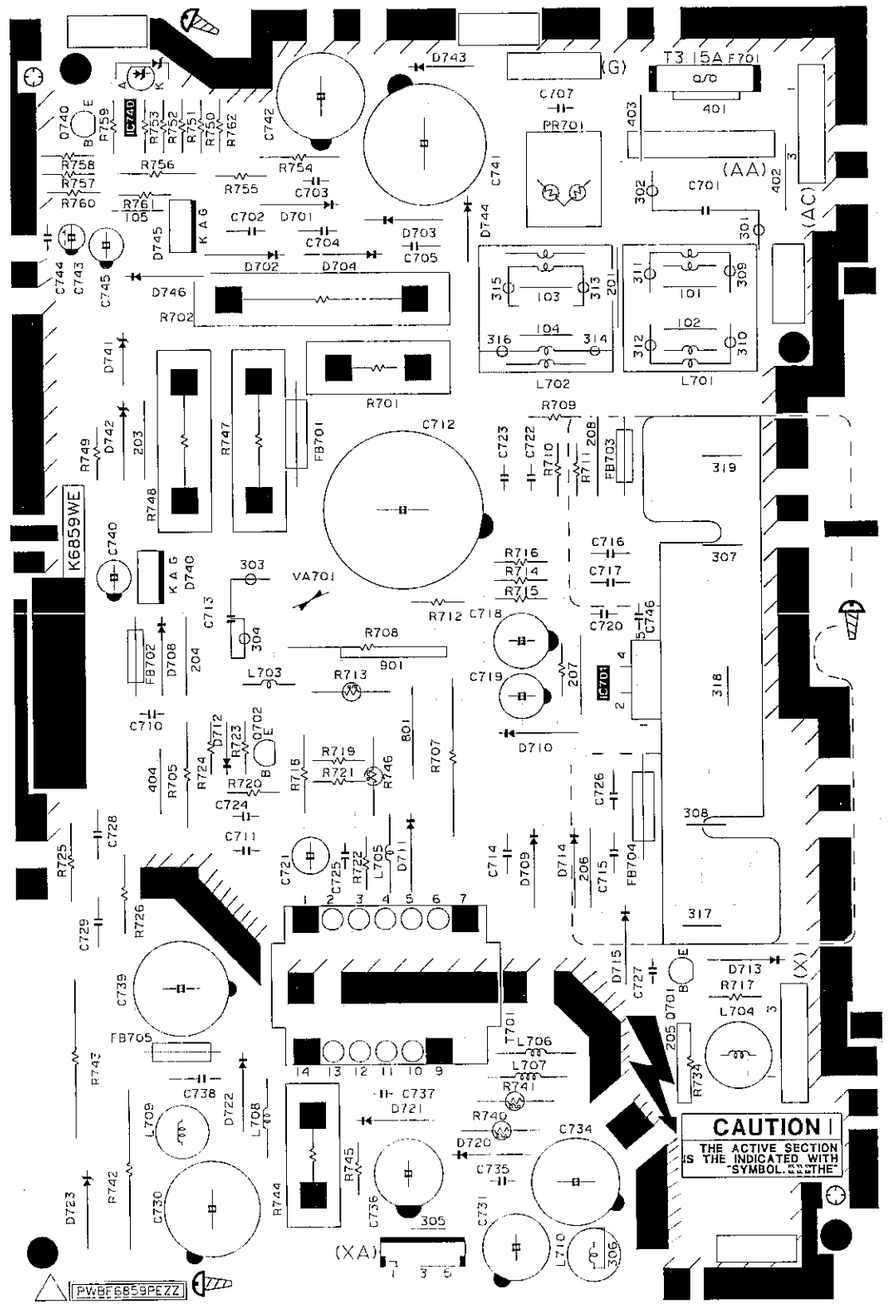


PWM-B Wiring Side

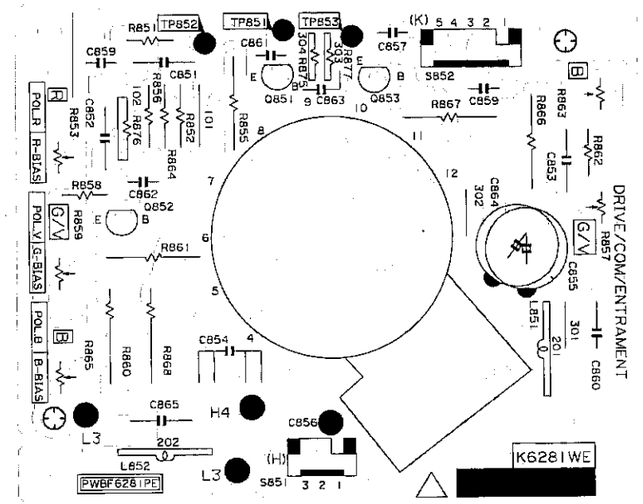


PWB-A Wiring Side

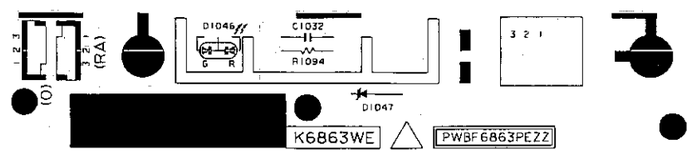
PRINTED WIRING BOARD ASSEMBLIES (Continued)



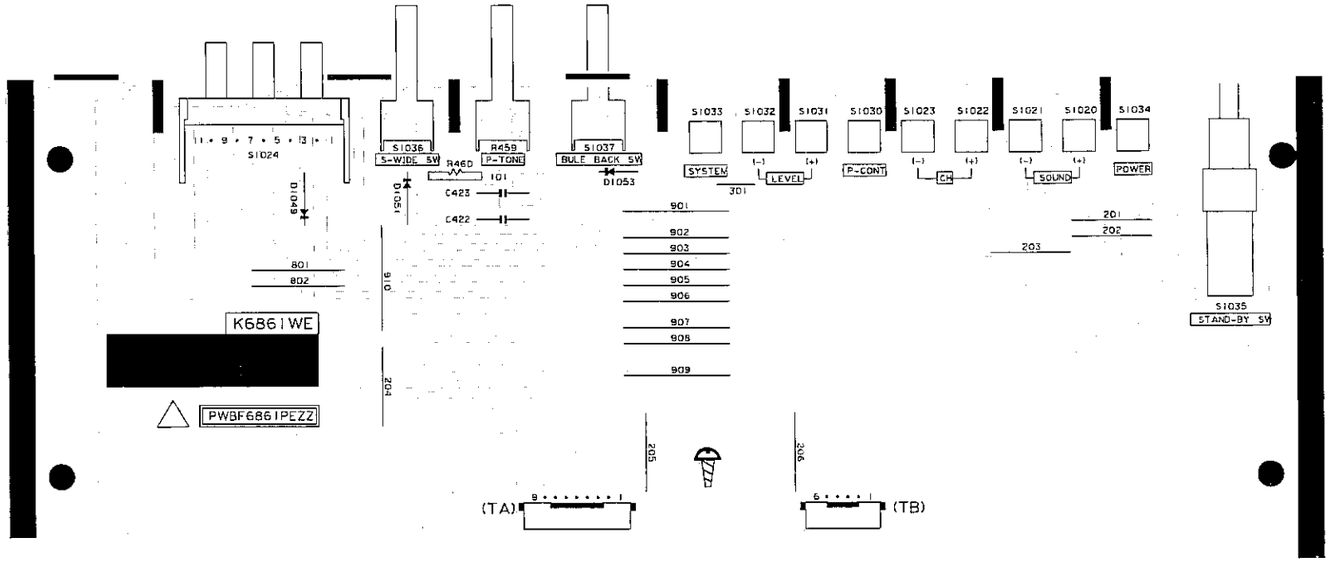
PWB-E Wiring Side



PWB-C Wiring Side

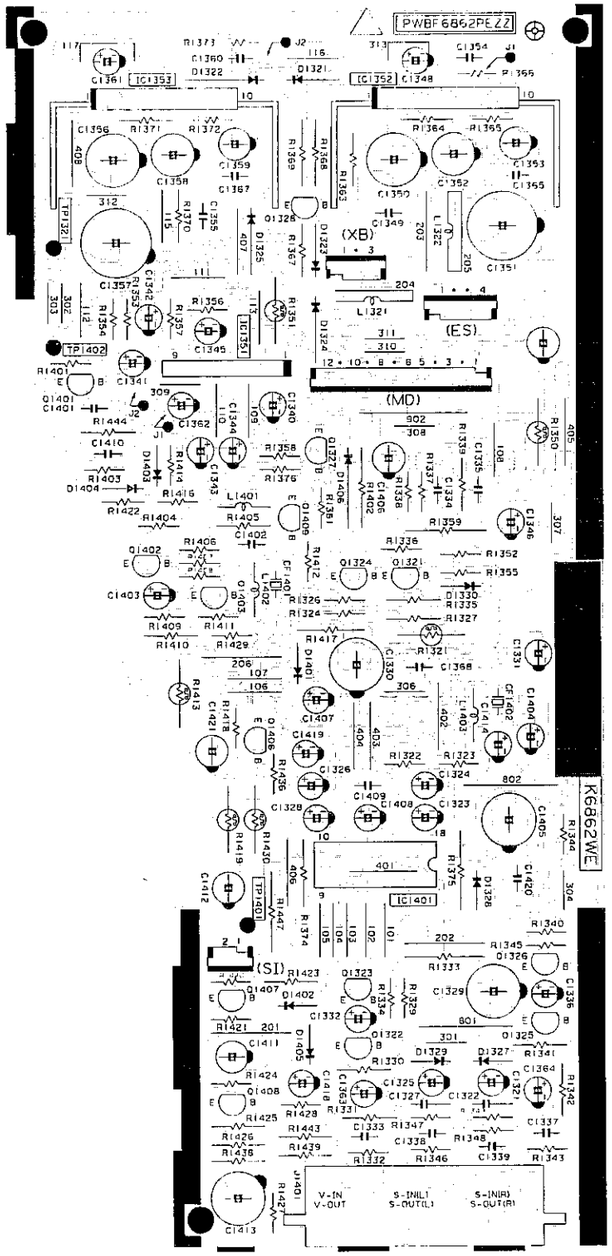


PWB-F Wiring Side



PWB-B Wiring Side

PRINTED WIRING BOARD ASSEMBLIES (Continued)



PWB-D Wiring Side

DESCRIPTION OF SCHEMATIC DIAGRAM

SAFETY NOTE:

1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACEING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.*

IMPORTANT SAFETY NOTICE:

1. *PARTS MARKED WITH "⚠" (▒▒▒) ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET. BE SURE TO REPLACE THESE PARTS WITH SPECIFIED ONES FOR MAINTAINING THE SAFETY AND PERFOMANCE OF THE SET.*
2. *▲ MARK: X-RAY RELATED PARTS.*

SERVICE PRECAUTION:

The area enclosed by this line (▬ ▪ ▬) is directly connected with AC Mains Voltage.
When servicing the area, connect an isolating transformer between TV receiver and AC line to eliminate hazard of electric shock.

NOTE:

1. *The unit of resistance "ohm" is omitted (K = 1000 ohms, M = 1 Meg ohm).*
2. *All resistors are 1/8 watt, unless otherwise noted.*
3. *All capacitors are μF, unless otherwise noted P = μμF.*
4. *The diodes, whose parts code is not described, are the 1SS119.*
5. *All resistors are 1/8W, unless otherwise noted.*

VOLTAGE MEASUREMENT CONDITIONS:

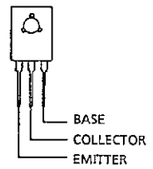
1. *Voltages without parenthesis measured with 3000 μV B & W or Color Signal.*
2. *The voltage in parenthesis represents the value measured with no signal.*
3. *All the voltages were measured by using a high impedance voltmeter.*

WAVEFORM MEASUREMENT CONDITIONS:

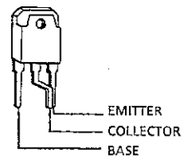
1. *The color bar signal applied to the TP401 is 1.8Vp-p.*
2. *The tuner AGC voltage is approximately 4V.*

SOLID STATE DEVICE BASE DIAGRAMS

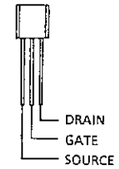
VS2SC2456
VS2SC2611



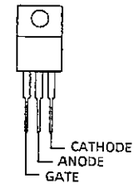
VS2SC1555



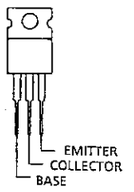
VS2SK304CD/-1

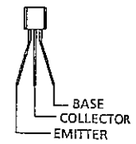


VHS5F5J42//-1



VS2SD880GLB-1

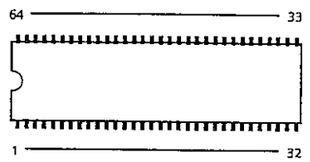




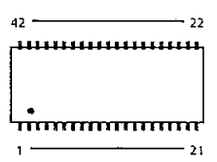
VS2SC1815GW-1
VS2SC1815YW-1
VS2SA1015Y/1E
VS2SA1015G/1E
VS2SC3399//-1
VS2SA950-Y/1E
VS2SC945AP/-1
VS2SC3279//1E
VS2SC3279N/-1
VS2SC383-WT-1
VS2SC3402//-1

TOP VIEW

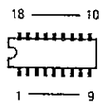
RH-IX0969CEN1



RH-IX1194CEN1



RH-IX0776CEZZ
RH-IX0711CEN1
VHIM51321P/-1



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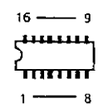
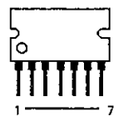


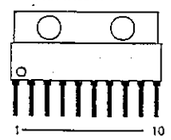
SIDE VIEW

RH-IX0260CEZZ

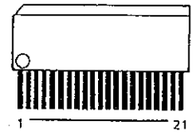
RH-IX0355CEZZ



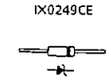
RH-IX0365CEZZ



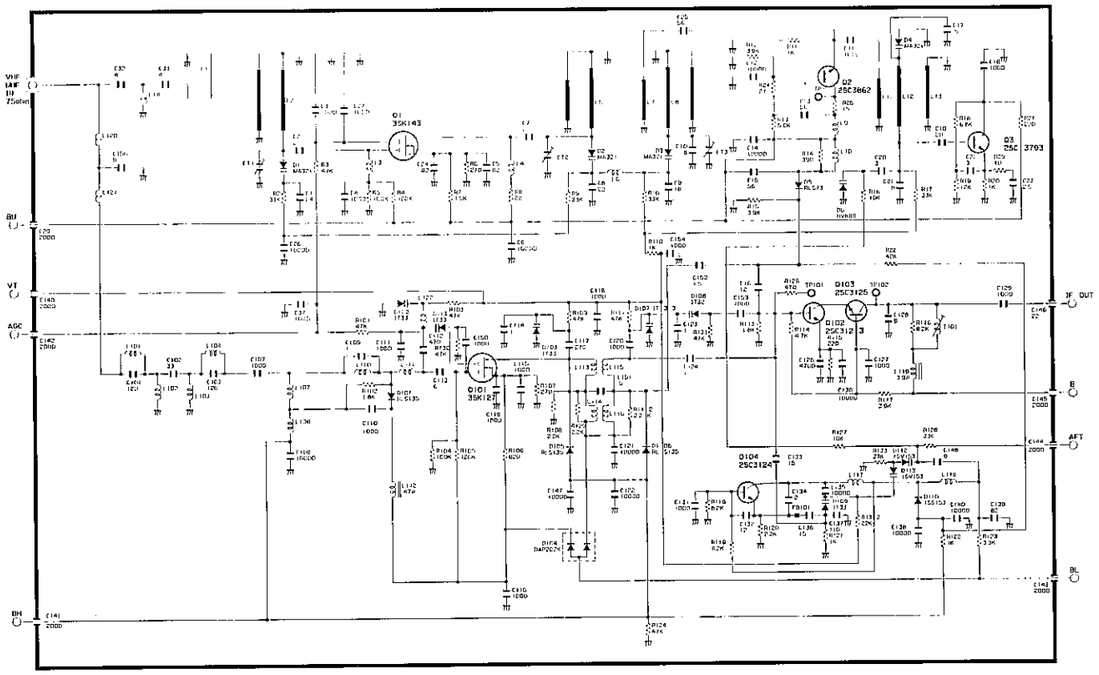
VHITA8763Z



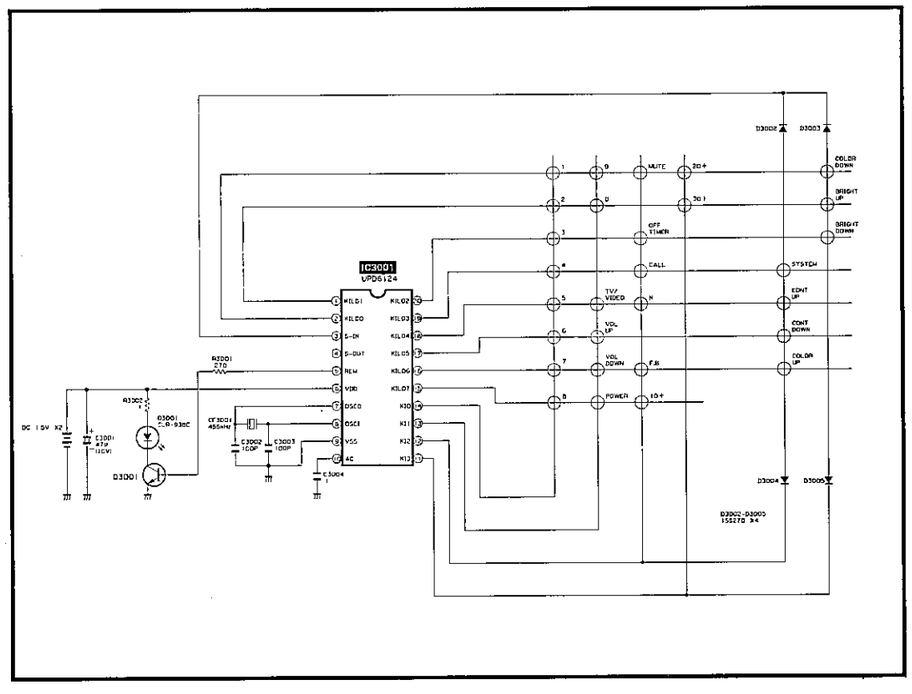
IX0249CE



TUNER CIRCUIT ⚠ VTUVTSA7S1///

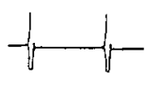
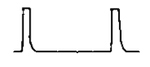
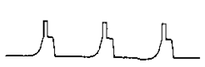
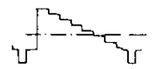
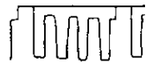
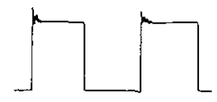


INFRARED REMOTE CONTROLLER CIRCUIT: RRMCG0756CESA



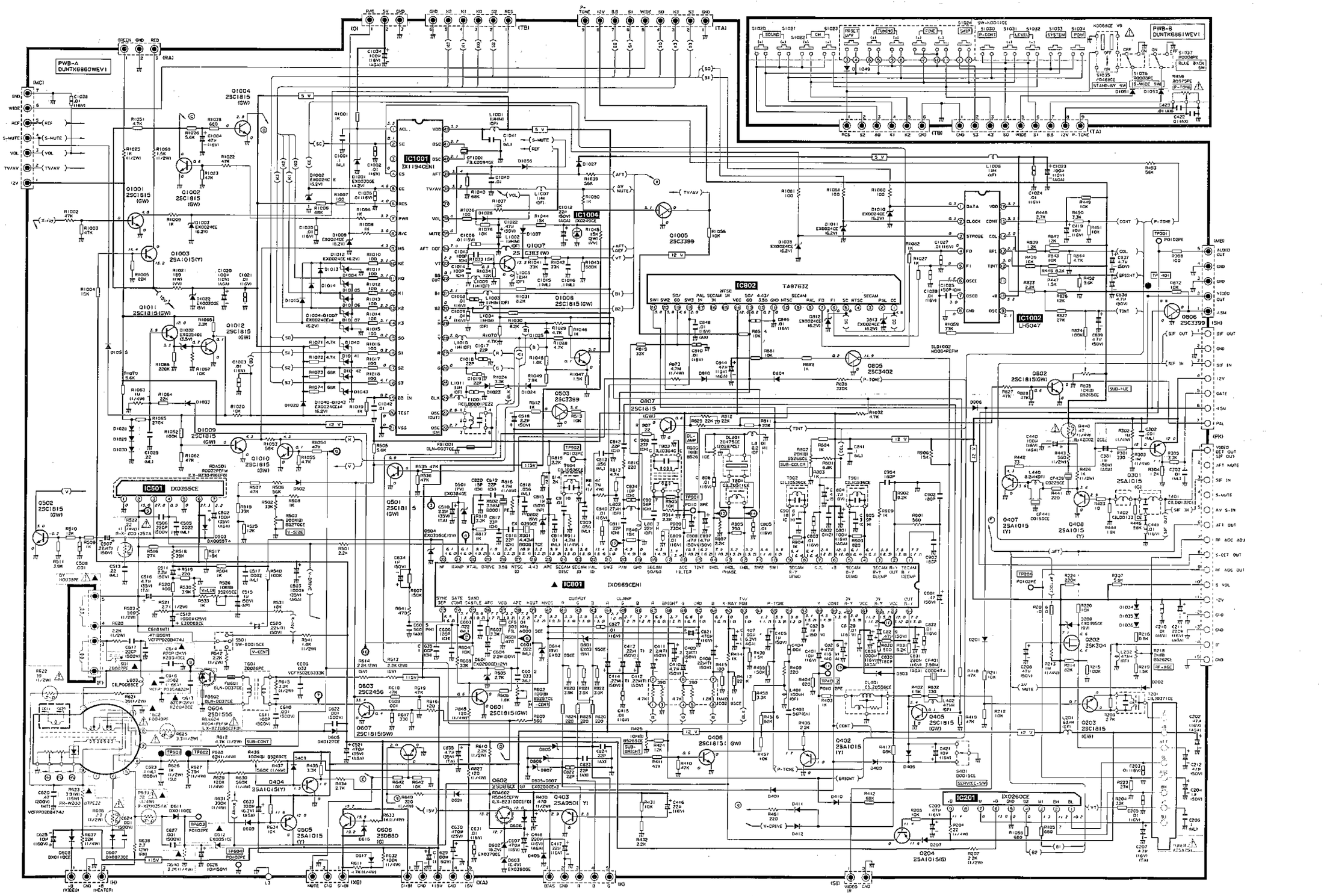
CAUTION: This circuit diagram is original one, therefore there may be a slight difference from yours.

WAVE FORMS

				
① 1.8Vp-p (H)	② 8.8Vp-p (H)	③ 2.0Vp-p (V)	④ 1.2Vp-p (V)	⑤ 56Vp-p (V)
				
⑥ 1.2Vp-p (H)	⑦ 120Vp-p (H)	⑧ 1030Vp-p (H)	⑨ 12.8Vp-p (H)	⑩ 9.2Vp-p (H)
				
⑪ 0.44Vp-p (H)	⑫ 0.3Vp-p (H)	⑬ 2.6Vp-p (H)	⑭ 0.32Vp-p (H)	⑮ 0.88Vp-p (H)
				
⑯ 0.68Vp-p (H)	⑰ 80Vp-p (H)	⑱ 86Vp-p (H)	⑲ 84Vp-p (H)	⑳ 680Vp-p (AC 220V)

SCHEMATIC DIAGRAM: MAIN CIRCUIT

▲ MARK: X-RAY RELATED PARTS.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PWB-B DUNTK6861WEV1
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IC1004 LH5047
IC802 T48763Z
IC501 IX0355CE
IC601 IX0969CEN1
IC201 IX0260CE
Q1001 2SC1815 (GW)
Q1002 2SC1815 (GW)
Q1003 2SA1015(Y)
Q1004 2SC1815 (GW)
Q1005 2SC3399
Q1006 2SC1815 (GW)
Q1007 2SC383 (W)
Q1008 2SC1815 (GW)
Q1009 2SC1815 (GW)
Q1010 2SC1815 (GW)
Q1011 2SC1815 (GW)
Q1012 2SC1815 (GW)
Q0501 2SC1815 (GW)
Q0502 2SC1815 (GW)
Q0503 2SC3399
Q0601 2SC1815 (GW)
Q0602 2SD1858
Q0603 2SC2456
Q0604 2SD1555
Q0606 2SB880
Q0607 2SC1815(GW)
Q0801 2SC1815 (GW)
Q0802 2SC1815(GW)
Q0803 2SK304
Q0804 2SC3399
Q0805 2SC3402
Q0806 2SC3399
Q0807 2SC1815 (GW)
Q0201 2SA1015 (Y)
Q0202 2SK304
Q0203 2SC1815 (GW)
Q0204 2SA1015(G)
Q0301 2SA1015 (Y)
Q0401 2SA1015 (Y)
Q0402 2SA1015 (Y)
Q0403 2SA950(Y)
Q0404 2SA1015(Y)
Q0405 2SC1815 (GW)
Q0406 2SC1815 (GW)
Q0407 2SA1015 (Y)
Q0408 2SA1015 (Y)
Q1049
D1051
D1052
D1053
SW-K0044CE
S1021 POWER
S1022 SOUND
S1023 CH
S1024 PRESET/MEMORY
S1025 TUNING
S1026 ZONE
S1027 SKIP
S1030 P-CONT
S1031 LEVEL
S1032 SYSTEM
S1033 POWER
S1034 STAND-BY SW
S1035 (STAND-BY)
S1036 (B-WIDE SW)
S1037 POWER
S1038 BLUE BACK SW
S1039 (P-TONE)
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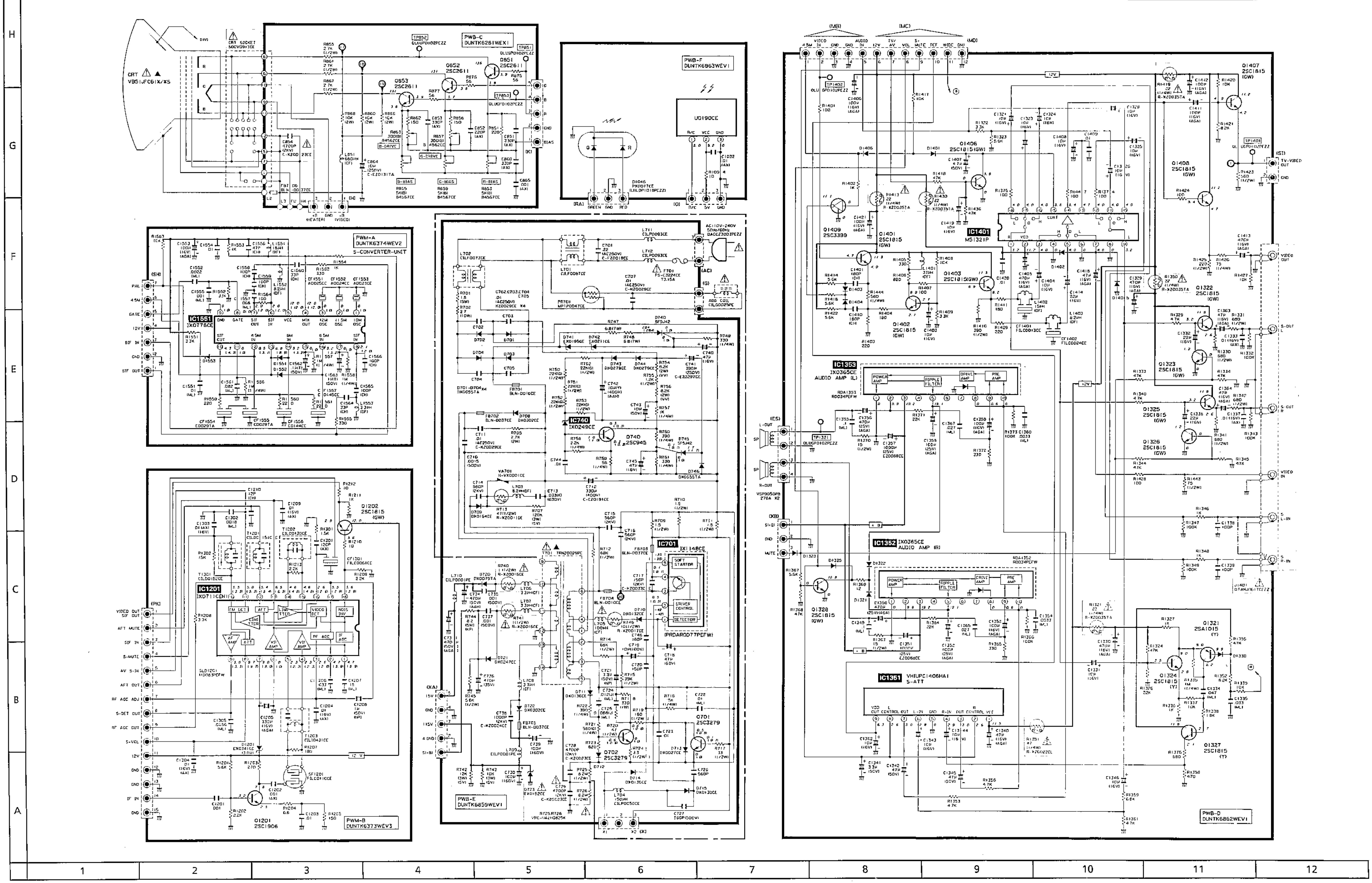
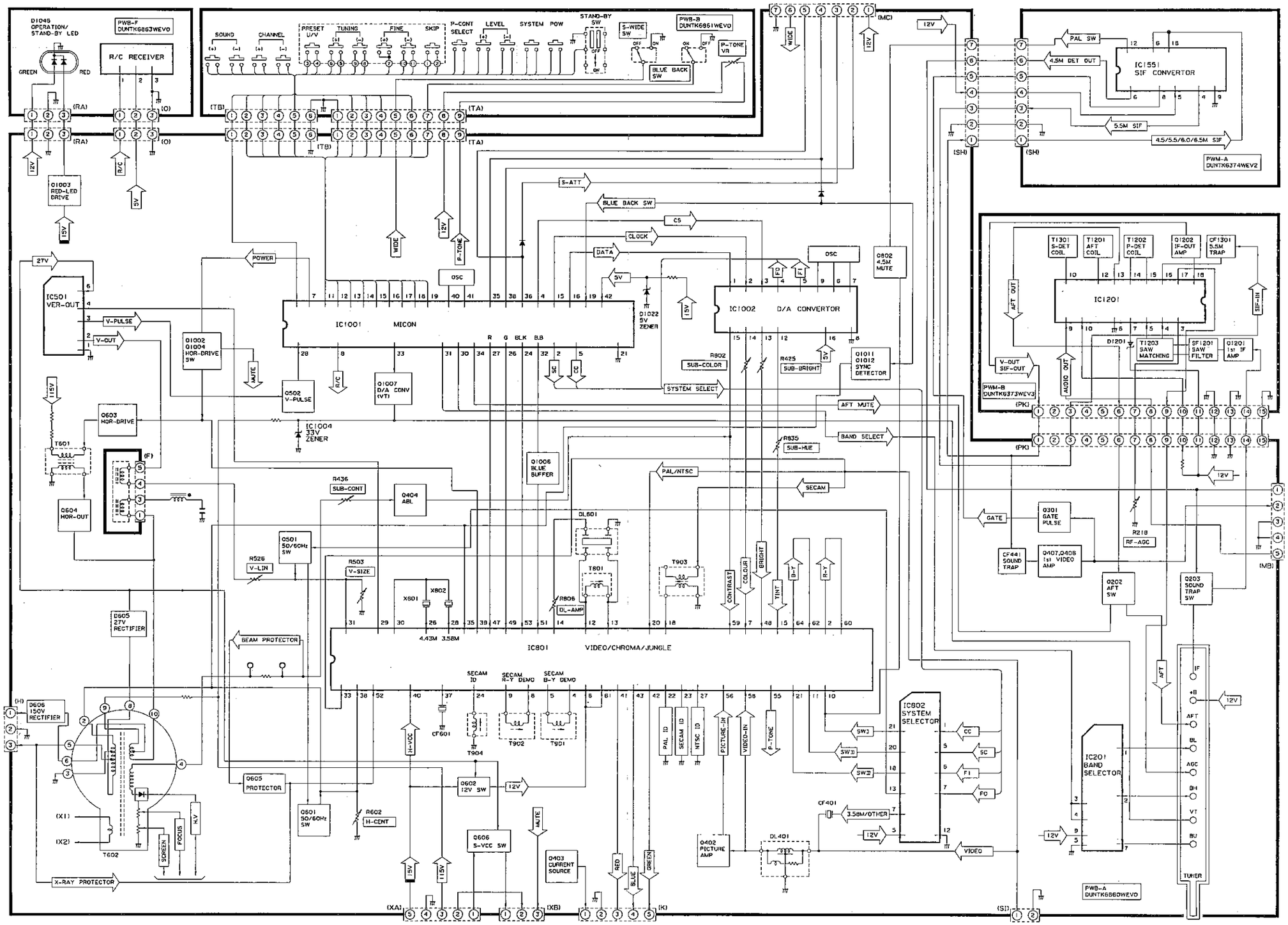
SCHEMATIC DIAGRAM: AV / S-OUTPUT, CRT and POWER CIRCUITS

▲ MARK: X-RAY RELATED PARTS.

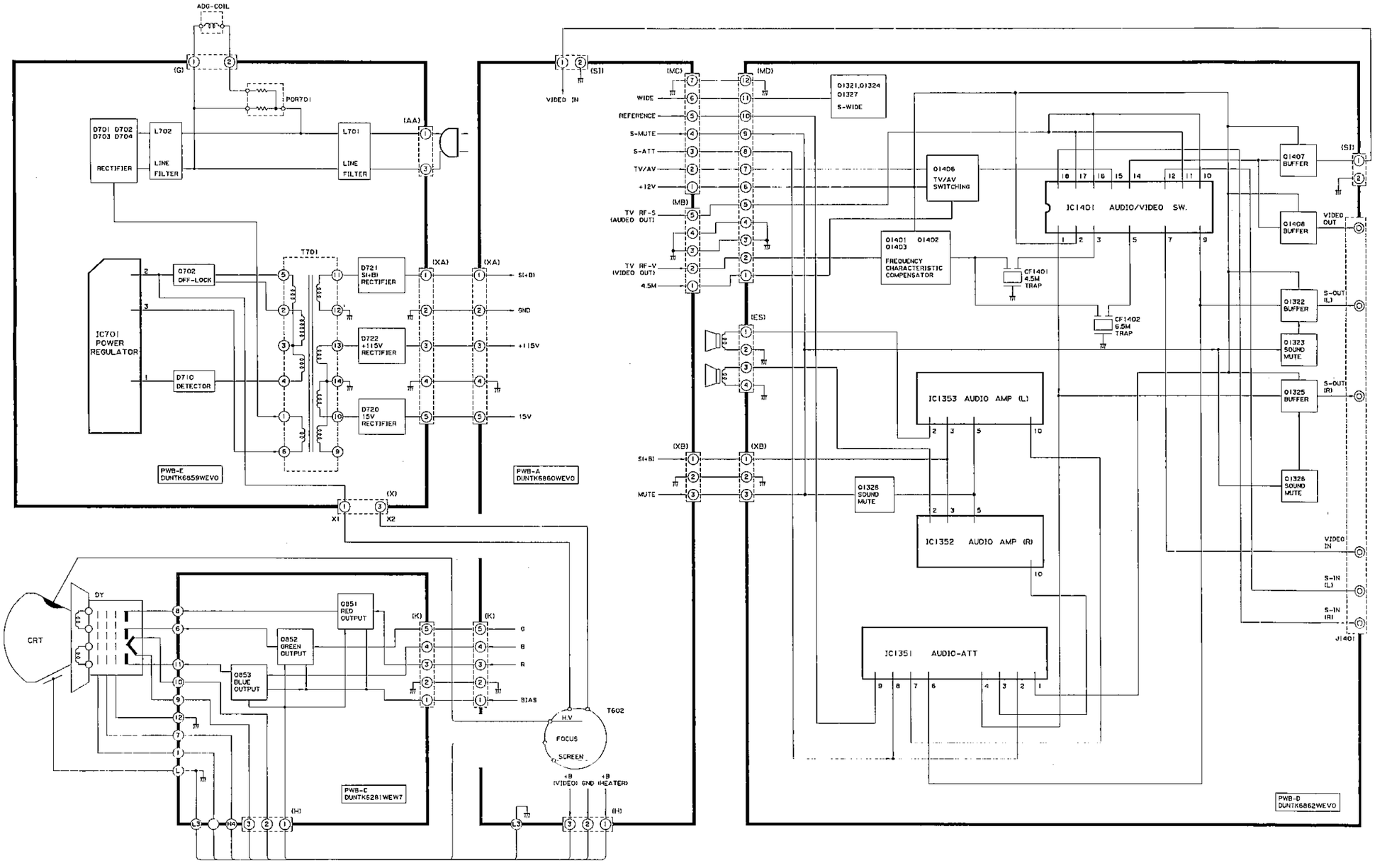


CRT VB51JFC61X/X5
CRT SOCKET SOCV0913CE
PWB-C DUNTK6281WEX1
Q851 2SC2611
Q852 2SC2611
Q853 2SC2611
B-DRIVE
G-DRIVE
B-BIAS
G-BIAS
R-BIAS
PWB-F DUNTK6863WEV1
UD190CE
PWM-A DUNTK6374WEV2
S-CONVERTER-UNIT
IC1551 IX0776CE
PWM-B DUNTK6373WEV3
IC1201 IX0711CEN1
Q1202 2SC1815 (GW)
Q1201 2SC1906
PWB-E DUNTK6859WEV1
IC740 IX0249CE
Q740 2SC945
IC701 IX1148CE
SOFT STARTOR
DRIVER CONTROL
DETECTOR
(PRDAR0077PEFW)
Q701 2SC3279
Q702 2SC3279
AC110V-240V 50Hz/60Hz
IC1401 M51321P
Q1401 2SC1815 (GW)
Q1402 2SC1815 (GW)
Q1403 2SC1815(GW)
Q1406 2SC1815(GW)
Q1407 2SC1815 (GW)
Q1408 2SC1815 (GW)
Q1409 2SC3399
IC1353 IX0365CE AUDIO AMP (L)
IC1352 IX0365CE AUDIO AMP (R)
IC1351 VHIUPC1406HA1 S-ATT
Q1321 2SA1015 (Y)
Q1322 2SC1815 (GW)
Q1323 2SC1815 (GW)
Q1324 2SC1815 (Y)
Q1325 2SC1815 (GW)
Q1326 2SC1815 (GW)
Q1327 2SC1815 (Y)
Q1328 2SC1815 (GW)
PWB-D DUNTK6862WEV1

BLOCK DIAGRAM-1



BLOCK DIAGRAM-2



PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual: electrical components having such features are identified by ⚠ in the Replacement Parts Lists.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

★MARK: SPARE PARTS-DELIVERY SECTION.

▲ MARK: X-RAY RELATED PARTS.

Ref. No.	Part No.	★	Description	Code

PICTURE TUBE

▲⚠	VB51JFC61X/*S	R	CRT	CF
▲⚠ DY	RCiLH0038PEZZ	R	Deflection Yoke	BL
⚠ L1	RCiLG0025PEZZ	R	Degaussing Coil	AW
	PMAGF3003CEZZ	J	Magnet Ass'y, Purity and Static Convergence	AK
	PSPAG0028CEZZ	J	Wedge (Rubber), Yoke Positioning (3 pcs used)	AB

PRINTED WIRING BOARD ASSEMBLIES

(NOT REPLACEMENT ITEM)

PWB-A	DUNTK6860WEV1	–	Mother Unit	—
PWB-B	DUNTK6861WEV1	–	Control Unit	—
PWB-C	DUNTK6281WEX1	–	CRT Socket Unit	—
PWB-D	DUNTK6862WEV1	–	AV/S-Output Unit	—
PWB-E	DUNTK6859WEV1	–	Powe Unit	—
PWB-F	DUNTK6863WEV1	–	R/C Receiver and LED Unit	—
PWM-A	DUNTK6374WEV2	–	Sound Converter Unit	—
PWM-B	DUNTK6373WEV3	–	IF Unit	—

Ref. No.	Part No.	★	Description	Code

PWB-A DUNTK6860WEV1
MOTHER UNIT

TUNER

NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.

⚠		VTUVTSA7S1///	J	Tuner	BE

INTEGRATED CIRCUITS

	IC201	RH-iX0260CEZZ	J	Band Switching	AF
	IC501	RH-iX0355CEZZ	J	Vertical Output	AS
▲	IC801	RH-iX0969CEN1	J	Video Chroma, Sync. Separator, Vertical / Horizontal Osc. and Driver	BG
	IC802	VHiTA8763Z/-1	J	System Switching	AM
	IC1001	RH-iX1194CEN1	J	Microprocessor	AW
	IC1002	VHiLH5047//-1	J	DAC	AM
	IC1004	RH-iX0249CEZZ	J	Zener IC	AE

TRANSISTORS

	Q202	VS2SK304CD/-1	J	2SK304	AC
	Q203, 405, 406, 501, 502, 601, 607, 802, 807, 1001, 1002, 1004, 1006, 1009, 1010, 1011, 1012	VS2SC1815GW-1	J	2SC1815 (GW)	AB
	Q204, 301	VS2SA1015G/1E	J	2SA1015 (G)	AC
	Q402, 404, 407, 408, 605, 1003	VS2SA1015Y/1E	J	2SA1015 (Y)	AC
	Q403	VS2SA950-Y/1E	J	2SA950 (Y)	AD
	Q503, 806, 1005	VS2SC3399//-1	J	2SC3399	AB

Ref. No.	Part No.	★	Description	Code

PWB-A DUNTK6860WEV1
MOTHER UNIT (Continued)

TRANSISTORS (Continued)

	Q602, 606	VS2SD880GLB-1	J	2SD880	AF
	Q603	VS2SC2456//1E	J	2SC2456	AE
⚠	Q604	VS2SD1555//1E	J	2SD1555	AP
	Q805	VS2SC3402//-1	J	2SC3402	AB
	Q1007	VS2SC383-WT-1	J	2SC383 (W)	AF

DIODES

	D201, 202, 207, 401, 405, 406, 408, 409, 410, 411, 412, 502, 606, 609, 616, 617, 621, 803, 804, 808, 810, 1013, 1014, 1015, 1020, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1033, 1034, 1035, 1036, 1037, 1055, 1056	VHD1SS119//1E	J	1SS119	AA

Ref. No.	Part No.	★	Description	Code

DIODES (Continued)

	D208, 504, 614, 801, 802	RH-EX0395GEZZ	J	Zener Diode, 9V	AA
	D501	RH-EX0384GEZZ	J	Zener Diode, 7V	AA
	D503	RH-DX0055TAZZ	J	1S1888	AD
	D601, 805, 806, 807	RH-EX0200CEZZ	J	Zener Diode, 12V	AB
	D602	RH-EX0379GEZZ	J	Zener Diode, 6.2V	AA
	D603	RH-EX0380GEZZ	J	Zener Diode, 6.4V	AA
	D605	RH-DX0127CEZZ	J	S5295G	AC
	D607	RH-DX0073CEZZ	J	RH17	AD
	D608, 611	RH-DX0110CEZZ	J	S5277G	AB
▲	D612	RH-EX0051CEZZ	J	Zener Diode	AB
	D812, 813, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1010, 1011, 1012, 1038, 1040, 1041, 1042, 1043	RH-EX0024CEZZ	J	Zener Diode 6.2V	AB
	D1001	RH-EX0030GEZZ	J	Zener Diode, 4.2V	AB
	D1022	RH-EX0020GEZZ	J	Zener Diode, 5V	AE
	D1032	RH-EX0354GEZZ	J	Zener Diode, 3.5V	AA

PACKAGED CIRCUITS

	X801	RCRSB0067CEZZ	J	Crystal, 4.43MHz	AQ
	X802	RCRSB0001PEZZ	R	Crystal, 3.58MHz	AL
	M401	RMPTC0295CEZZ	J	Resistor Array	AE

COILS

	L201	VP-DF680K0000	J	68µH	AB
	L202	VP-RF470K0000	J	47µH	AB
	L401	VP-OF101K0000	J	100µH	AC
	L402	VP-DF470K0000	J	47µH	AB
	L440, 801	VP-DF8R2K0000	J	8.2µH	AB

PWB-A DUNTK6860WEV1

MOTHER UNIT (Continued)

COILS (Continued)

Ref. No.	Part No.	★	Description	Code
▲ L601	RCiLZ0007PEZZ	R	Linearity Coil	AK
L603	RCiLP0088CEZZ	J		AG
L802	VP-DF270K0000	J	27µH	AB
L803	VP-DF220K0000	J	22µH	AB
L1001, 1002, 1003, 1004, 1007, 1009, 1010, 1011	VP-DF1R0M0000	J	1µH	AB
L1005	VP-DF120K0000	J	12µH	AB
L1006	VP-XF1R0K0000	J	1µH	AB

CERAMIC FILTERS

Ref. No.	Part No.	★	Description	Code
CF401	RFiLC0004TAZZ	J	3.58MHz Trap	AE
CF439	RFiLC0228CEZZ	J	5.74MHz Trap	AF
CF441	RFiLC0150CEZZ	J	5.6/6.0MHz Trap	AF
CF601	RFiLA0005CEZZ	J	Osc., 503kHz	AE
CF1001	RFiLC0094GEZZ	J	Osc., 4.0MHz	AC

DELAY LINES

Ref. No.	Part No.	★	Description	Code
DL401	RCiLZ0556CEZZ	J	Y-Delay	AG
DL801	RCiLZ0475CEZZ	J	1H-Delay	AP

TRANSFORMERS

Ref. No.	Part No.	★	Description	Code
T201	RCiLi0371CEZZ	J	4.5MHz Trap	AD
T401	RCiLD0132CEZZ	J	Carrier Filter	AD
T402	RCiLD0133CEZZ	J	Carrier Filter	AD
T601	RTRNZ0026PEZZ	R	H-Drive Trans.	AH
▲ T602	RTRNF0049PEZZ	R	Flyback Trans.	BN
T801	RCiLZ0511CEZZ	J	1H-Phase	AD
T901, 902, 904	RCiLi0536CEZZ	J	B-Y Demodulator, R-Y Demodulator, Identical Descriminator	AD
T903	RCiLi0364CEZZ	J	Bell Filter	AD
T1001	RCiLB0001PEZZ	R	Channel Sign Horiz. Position Coil	AG

CONTROLS

Ref. No.	Part No.	★	Description	Code
R218	RVR-B5262CEZZ	J	2k(B) RF-AGC	AB
R425, 526, 835	RVR-B5265CEZZ	J	10k(B) Sub-Bright., Vert. Linearity, Sub-Hue	AB
R436	RVR-B5269CEZZ	J	100k(B) Sub-Contrast	AB
R503	RVR-B5270CEZZ	J	200k(B) V-Size	AB
R602	RVR-B5257CEZZ	J	100(B) H-Center	AB
R802	RVR-B5266CEZZ	J	20k(B) Sub-Color	AB
R806	RVR-B5261CEZZ	J	1k(B) DL-Amp.	AB

CAPACITORS

Ref. No.	Part No.	★	Description	Code
C207	VCSATA1CE475K	J	4.7 16V Tantalum	AC
C211, 418, 831	VCEAGA1CW227M	J	220 16V Electrolytic	AC
C407	VCEAGA0JW107M	J	100 6.3V Electrolytic	AB
C440, 801, 1034	VCEAGA1CW107M	J	100 16V Electrolytic	AB
C502	VCEAGA1VW107M	J	100 35V Electrolytic	AC
C503	VCEAGA1VW108M	J	1000 35V Electrolytic	AD
C506, 617	VCKYPA2HB221K	J	220p 50(V Ceramic	AA
C510	VCSATA1VE225K	J	2.2 35V Tantalum	AC
C512	RC-EZ0088CEZZ	J	1000 25V Electrolytic	AE
C515, 815	VCE9AA1HW105M	J	1 50V Electrolytic (N.P)	AB
C516, 835	VCSATA1VE475K	J	4.7 35V Tantalum	AD
C521	VCEAGA1VW477M	J	470 35V Electrolytic	AD
C607, 821	VCEAAA1CW477M	J	470 16V Electrolytic	AC
C608	VCFYSB2EB333K	J	0.033 250V Mylar	AC
C610, 622, 624, 627	VCKYPA2HB102K	J	0.001 500V Ceramic	AA
C611	VCKYPA2HB101K	J	100p 50(V Ceramic	AA
▲ C613, ▲ 614	RC-KZ0040CEZZ	J	820p 2kV Ceramic	AD
▲ C616	VCFPPD3CA822H	J	0.0082 1.6kV Metalized Polyester	AE
C618, 620	VCFPPD2DB474J	J	0.47 200V Metalized Polyester	AE
C623	VCQYSH2DM104K	J	0.1 200V Mylar	AD
C625	VCEAAA2CW106M	J	10 160V Electrolytic	AC
C629	VCEAAH2CW107M	J	100 160V Electrolytic	AE
C630	VCEAAA1EW477M	J	470 25V Electrolytic	AD
C633	VCEAGA0JW337M	J	330 6.3V Electrolytic	AB
C836	VCEAGA1CW108M	J	1000 16V Electrolytic	AD
C1020, 1023	VCEAGA1AW107M	J	100 10V Electrolytic	AB

Ref. No.	Part No.	★	Description	Code

PWB-A DUNTK6860WEV1
MOTHER UNIT (Continued)

Ref. No.	Part No.	★	Description	Code
RESISTORS				
⚠ R440	RR-XZ0022CEZZ	J	47 1/4W Fuse Resistor	AB
⚠ R522,	RR-XZ0035TAZZ	J	22 1/4W Fuse Resistor	AB
▲⚠ 639				
R613,	VRS-SV3DB222J	J	2.2k 2W Metal Oxide	AB
614				
⚠ R622	VRG-RL2HB390J	J	39 1/2W Fuse Resistor	AB
▲ R623	RR-WZ0007PEZZ	R	3.9 15W Cement	AG
⚠ R625	VRG-RL2HB3R3J	J	3.3 1/2W Fuse Resistor	AB
R626	VRS-SU2HB102J	J	1k 1/2W Metal Oxide	AA
⚠ R636	VRG-RL2HB2R2J	J	2.2 1/2W Fuse Resistor	AB
R638	VRN-RV3DB2R7J	J	2.7 2W Metal Oxide	AB
▲ R640	VRD-RA2EE332J	J	3.3k 1/4W Carbon	AA
R1021	VRS-VV3AB181J	J	180 1W Metal Oxide	AA
R1045	VRS-VV3DB153J	J	15k 2W Metal Oxide	AA
SWITCHES				
S401,	QSW-B0015CEZZ	J	Switch, Service,	AC
501			Vertical Center	
MISCELLANEOUS PARTS				
FB601,	RBLN-0037CEZZ	J	Ferrite Bead	AB
602,				
1001				
	QSOCZ0930GEZZ	J	Socket, 9 pin (TA)	AC
	QSOCZ0630GEZZ	J	Socket, 6 pin (TB)	AC

PWB-B DUNTK6861WEV1
CONTROL UNIT

Ref. No.	Part No.	★	Description	Code
DIODES				
D1049,	VHD1SS119//1E	J	1SS119	AA
1051,				
1053				
CONTROL				
⚠ R459	RVR-B0075PEZZ	R	10k(B) Picture Tone	AF
SWITCHES				
⚠ S1020,	QSW-K0068CEZZ	J	Sound (+),	AB
⚠ 1021,			Sound (−),	
⚠ 1022,			Channel (+),	
⚠ 1023,			Channel (−),	
⚠ 1030,			P-Control,	
⚠ 1031,			Level (+),	
⚠ 1032,			Level (−),	
⚠ 1033,			System,	
⚠ 1034			Power	
⚠ S1024	QSW-K0041CEZZ	J	Tuning Block	AK
⚠ S1035	QSW-P0488CEZZ	J	Stand-by	AE
⚠ S1036,	QSW-R0008PEZZ	R	S-Wide,	AG
⚠ 1037			Bule Back	
MISCELLANEOUS PARTS				
	QPLGZ0930GEZZ	J	Plug, 9 pin (TA)	AC
	QPLGZ0630GEZZ	J	Plug, 6 pin (TB)	AC

PWB-C DUNTK6281WEX1
CRT SOCKET UNIT

Ref. No.	Part No.	★	Description	Code
TRANSISTORS				
Q851,	VS2SC2611//-1	J	2SC2611	AE
852,				
853				
COIL				
L851	VP-CF681K0000	J	680µH	AB
CONTROLS				
R853,	RVR-B4567CEZZ	J	5k (B) Red Bias,	AC
859,			Green Bias,	
865			Blue Bias	
R857,	RVR-B4562CEZZ	J	300 (B) Green Drive,	AC
863			Blue Drive	

Ref. No.	Part No.	★	Description	Code

PWB-C DUNTK6281WEX1
CRT SOCKET UNIT (Continued)

CAPACITORS

⚠ C854	RC-KZ0023CEZZ	J	4700p 2kV Ceramic	AD
C864	RC-EZ0131TAZZ	J	10 250VElectrolytic	AD

RESISTORS

R855, 861, 867	VRC-MA2HG272J	J	2.7k 1/2W Sold	AA
R860, 866, 868	VRS-VV3DB103J	J	10k 2W Metal Oxide	AA

MISCELLANEOUS PARTS

⚠	QSOCV0913CEZZ	J	CRT Socket	AK
FB706	RBLN-0037CEZZ	J	Ferrite Bead	AB

PWB-D DUNTK6862WEV1
AV/S-OUTPUT UNIT

INTEGRATED CIRCUITS

IC1351	VHiUPC1406HA1	J	Sound Att.	AH
IC1352, 1353	RH-iX0365CEZZ	J	Sound Output (R), Sound Output (L)	AK
IC1401	VHiM51321P/-1	J	AV Switching	AL

TRANSISTORS

Q1321	VS2SA1015Y/1E	J	2SA1015 (Y)	AC
Q1322, 1323, 1325, 1326, 1328, 1401, 1402, 1403, 1406, 1407, 1408	VS2SC1815GW-1	J	2SC1815 (GW)	AB
Q1324, 1327	VS2SC1815YW-1	J	2SC1815 (Y)	AC
Q1409	VS2SC3399//-1	J	2SC3399	AB

Ref. No.	Part No.	★	Description	Code

DIODES

D1321, 1322, 1323, 1325, 1330, 1401, 1402, 1403, 1404, 1405, 1406	VHD1SS119//1E	J	1SS119	AA

COILS

L1401	VP-DF330K0000	J	33µH	AB
L1402	VP-DF150K0000	J	15µH	AB
L1403	VP-DF8R2K0000	J	8.2µH	AB

CERAMIC FILTERS

CF1401	RFiLC0013CEZZ	J	4.5MHz Trap	AE
CF1402	RFiLC0024CEZZ	J	6.5MHz Trap	AE

CAPACITORS

C1329, 1330, 1405, 1413	VCEAGA1CW477M	J	470 16V Electrolytic	AC
C1350, 1356	VCEAGA1EW477M	J	470 25V Electrolytic	AD
C1351, 1357	RC-EZ0088CEZZ	J	1000 125VElectrolytic	AE
C1352, 1358	VCEAGA1EW107M	J	100 25V Electrolytic	AD
C1353, 1359, 1406, 1411, 1412, 1421	VCEAGA1CW107M	J	100 16V Electrolytic	AB

RESISTORS

⚠ R1321, ⚠ 1350, ⚠ 1413, ⚠ 1419, ⚠ 1430	RR-XZ0035TAZZ	J	22 1/4W Fuse Resistor	AB
⚠ R1351	RR-XZ0022CEZZ	J	47 1/4W Fuse Resistor	AB

MISCELLANEOUS PART

⚠ J1401	QTANJ0617CEZZ	J	AV Input Termianl	AH

PWB-E DUNTK6859WEV1
POWER UNIT

Ref. No.	Part No.	★	Description	Code
INTEGRATED CIRCUITS				
⚠ IC701	RH-iX1148CEZZ	J	Power	AX
⚠ IC740	RH-iX0249CEZZ	J	Zener IC	AE
TRANSISTORS				
⚠ Q701	VS2SC3279//1E	J	2SC3279	AA
⚠ Q702	VS2SC3279N/-1	J	2SC3279	AC
⚠ Q740	VS2SC945AP/-1	J	2SC945	AB
DIODES				
⚠ D701, ⚠ 702, ⚠ 703, ⚠ 704, ⚠ 746	RH-DX0055TAZZ	J	1S1888	AD
⚠ D708, 722	RH-DX0302CEZZ	J	EU2A	AC
⚠ D709	RH-DX0164CEZZ	J	ES1F	AC
⚠ D710	RH-DX0132CEZZ	J	EU1A	AC
⚠ D711, ⚠ 714, ⚠ 715	RH-DX0130CEZZ	J	EU-1Z	AE
⚠ D712	VHD1SS119//1E	J	1SS119	AA
⚠ D713	RH-DX0027CEZZ	J	SV03YSV	AE
D720	RH-DX0079TAZZ	J	RU2	AE
D721	RH-DX0247CEZZ	J	RU3AMV1	AE
⚠ D723	RH-EX0152CEZZ	J	Avalanche Diode	AE
⚠ D740, ⚠ 745	VHSSF5J42//-1	J	Thyristor	AK
⚠ D741	RH-EX0195GEZZ	J	Zener Diode	AA
⚠ D742	RH-EX0211CEZZ	J	Avalanche Diode	AK
⚠ D743, ⚠ 744	RH-DX0279CEZZ	J	1N4005	AB
⚠ VA701	RH-VX0001CEZZ	J	Varistor	AF
PACKAGED CIRCUIT				
⚠ PR701	RMPTP0047CEZZ	J	Positive Coefficient	AK
COILS				
⚠ L701	RCiLF0087CEZZ	J	Line Filter	AL
⚠ L702	RCiLF0073CEZZ	J	Line Filter	AG
⚠ L703	VP-DF8R2K0000	J	8.2µH	AB
⚠ L704	RCiLP0050CEZZ	J	Choke Coil	AE
⚠ L705	VP-CF101K0000	J	100µH	AB
L706, 707, 708	VP-CF3R3K0000	J	3.3µH	AB

Ref. No.	Part No.	★	Description	Code
COILS (Continued)				
L709, 710	RCiLP0001PEZZ	R	Choke Coil	AF
⚠ L711, ⚠ 712	RCiLP0093CEZZ	J	Choke Coil	AE
TRANSFORMER				
▲⚠ T701	RTRNZ0029PEZZ	R	Regulator Trans.	BB
CAPACITORS				
⚠ C701	RC-FZ0018CEZZ	J	0.22 AC250V Metalized Polyester	AH
⚠ C702, ⚠ 703, ⚠ 704, ⚠ 705, ⚠ 707, ⚠ 711	RC-KZ0029CEZZ	J	0.01 AC250V Ceramic	AC
⚠ C710	VCKYPA2HB152K	J	0.0015 500V Ceramic	AA
⚠ C712	RC-EZ0191CEZZ	J	330 400VElectrolytic	AS
⚠ C713	VCQPSC2JA333K	J	0.033 630V Mylar	AB
⚠ C714, ⚠ 715, ⚠ 716	VCKYPH3DB561K	J	560p 2kV Ceramic	AC
⚠ C717	RC-KZ0033CEZZ	J	150p 2kV Ceramic	AB
⚠ C718	VCEAAA1JN476M	J	47 63V Electrolytic	AC
⚠ C719	VCEAAA2AN106M	J	10 100VElectrolytic	AC
⚠ C720	VCCSPA1HL151J	J	150p 50V Ceramic	AA
⚠ C721	VCE9AA1HW335M	J	3.3 50V Electrolytic (N.P)	AE
⚠ C722	VCQYVA1HA103J	J	0.01 50V Mylar	AA
⚠ C723, ⚠ 744	VCKZPA1HF103Z	J	0.01 50V Ceramic	AA
⚠ C724	VCQYVA1HA123J	J	0.012 50V Mylar	AA
⚠ C725	VCQYVA1HA682J	J	0.0068 50V Mylar	AA
⚠ C726	VCKZPA1HB561K	J	560p 50V Ceramic	AA
⚠ C727	VCKYPA2HB561K	J	560p 500VCeramic	AA
⚠ C728, ⚠ 729	RC-KZ0023CEZZ	J	4700p 2kV Ceramic	AD
C730, 739	VCEAAH2CW107M	J	100 160VElectrolytic	AE
C731	VCEAGA1HW477M	J	470 50V Electrolytic	AD
C734	VCEAAH1HW477M	J	470 50V Electrolytic	AE
C735, 737	VCKYPA2HB102K	J	0.001 500V Ceramic	AA
C736	VCEAAA1VW477M	J	470 35V Electrolytic	AD
C738	RC-KZ0024CEZZ	J	1000p 2kV Ceramic	AC
⚠ C740, ⚠ 745	VCEAAA1CW476M	J	47 16V Electrolytic	AB
⚠ C741	RC-EZ0297CEZZ	J	390 250VElectrolytic	AN
⚠ C742	VCEAAH2GW106Y	J	10 400VElectrolytic	AE
⚠ C743	VCEAAA1HW106M	J	10 50V Electrolytic	AB
⚠ C746	VCCSPA1HL181J	J	180p 50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code

PWB-E DUNTK6859WEV0
POWER UNIT (Continued)

RESISTORS

⚠ R701	VRW-KP3HC1R8K	J	1.8	5W	Cement	AC
⚠ R702	VRW-KP4AC2R7K	J	2.7	10W	Cement	AF
⚠ R705	VRS-VV3DB272J	J	2.7k	2W	Metal Oxide	AA
⚠ R707	VRS-SV3LB124J	J	120k	3W	Metal Oxide	AC
⚠ R709, ⚠ 710, ⚠ 711	VRD-RM2HD1R5J	J	1.5	1/2W	Carbon	AA
⚠ R712, ⚠ 714	VRD-RM2HD683J	J	68k	1/2W	Carbon	AA
⚠ R713	RR-XZ0011GEZZ	J	47	1/2W	Fuse Resistor	AB
⚠ R715	VRD-RM2HD393J	J	39k	1/2W	Carbon	AA
⚠ R716	VRD-RA2EE153J	J	15k	1/4W	Carbon	AA
⚠ R717	VRD-RM2HD330J	J	33	1/2W	Carbon	AA
⚠ R718	VRS-VV3AB331J	J	330	1W	Metal Oxide	AA
⚠ R719	VRD-RM2HD181J	J	180	1/2W	Carbon	AA
⚠ R720	VRD-RM2HD470J	J	47	1/2W	Carbon	AA
⚠ R721	VRD-RA2EE561G	J	560	1/4W	Carbon	AA
⚠ R722, ⚠ 760	VRD-RA2EE391J	J	390	1/4W	Carbon	AA
⚠ R723	VRD-RA2BE821J	J	820	1/8W	Carbon	AA
⚠ R724	VRD-RM2HD3R3J	J	3.3	1/2W	Carbon	AA
⚠ R725, ⚠ 726	VRC-UA2HG825K	J	8.2M	1/2W	Solid	AA
⚠ R740, ⚠ 741	RR-XZ0016CEZZ	J	1	1/2W	Fuse Resistor	AB
R742	VRS-SV3LB123J	J	12k	3W	Metal Oxide	AB
R743	VRS-SV3LB103J	J	10k	3W	Metal Oxide	AB
R744	VRW-KP3HC8R2K	J	8.2	5W	Cement	AC
⚠ R746	RR-XZ0017CEZZ	J	10	1/2W	Fuse Resistor	AB
⚠ R747, ⚠ 748	VRW-KP3NC6R8K	J	6.8	7W	Cement	AC
⚠ R749, ⚠ 761	VRD-RA2EE331J	J	330	1/4W	Carbon	AA
⚠ R750, ⚠ 751, ⚠ 752, ⚠ 753, ⚠ 762	VRD-RA2HD223G	J	22k	1/2W	Carbon	AA
⚠ R754, ⚠ 756	VRS-VV3DB822J	J	8.2k	2W	Metal Oxide	AA
⚠ R755	VRD-RM2HD122J	J	1.2k	1/2W	Carbon	AA
⚠ R757	VRD-RA2EE102J	J	1k	1/4W	Carbon	AA
⚠ R758	VRD-RA2EE222J	J	2.2k	1/4W	Carbon	AA
⚠ R759	VRD-RA2EE560J	J	56	1/4W	Carbon	AA

Ref. No.	Part No.	★	Description	Code

MISCELLANEOUS PART

⚠ F701	QFS-C3224CEZZ	J	Fuse T3.15A	AD
	QFSHD1002CEZZ	J	Fuse Holder (2 used)	AA
⚠ FB701, ⚠ 704	RBLN-0010CEZZ	J	Ferrie Bead	AC
⚠ FB702, 703, 705	RBLN-0037CEZZ	J	Ferrie Bead	AB

PWB-F DUNTK6863WEV1
REMOTE CONTROL RECEIVER AND LED UNIT

DIODE

D1046	RH-PX0077CEZZ	J	LED (Red/Green)	AE

MISCELLANEOUS PART

	RRMCU0190CEZZ	J	R/C Receiver	AL

PWM-A DUNTK6374WEV2
SOUND CONVERTER UNIT

INTEGRATED CIRCUIT

IC1551	RH-iX0776CEZZ	J	Sound Converter	AN

DIODES

D1551, 1552, 1553	VHD1SS119//1E	J	1SS119	AA

COILS

L1551	VP-XF180K0000	J	18µH	AB
L1552	VP-DF8R2K0000	J	8.2µH	AB
L1553	VP-DF3R3K0000	J	3.3µH	AB

CERAMIC FILTERS

CF1551	RFiLA0025CEZZ	J	12MHz Osc.	AF
CF1552	RFiLA0024CEZZ	J	11.5MHz Osc.	AF
CF1553	RFiLA0023CEZZ	J	10MHz Osc.	AF
CF1554, 1555	RFiLC0029TAZZ	J	4.5MHz Filter	AD
CF1556	RFiLC0144CEZZ	J	6MHz Filter	AD
CF1557	RFiLC0145CEZZ	J	6.5MHz Filter	AE

Ref. No.	Part No.	★	Description	Code

PWM-B DUNTK6373WEV3
IF UNIT

Ref. No.	Part No.	★	Description	Code
INTEGRATED CIRCUIT				
IC1201	RH-iX0711CEN1	J	PIF/SIF	AN
TRANSISTORS				
Q1201	VS2SC1906//1E	J	2SC1906	AC
Q1202	VS2SC1815GW-1	J	2SC1815 (GW)	AB
DIODE				
D1201	RH-EX0341GEZZ	J	Zener Diode, 3.0V	AA
TRANSFORMERS				
T1201	RCiLD0151CEZZ	J	AFT	AF
T1202	RCiLD0130CEZZ	J	Picture Detector Coil	AD
T1203	RCiLi0431CEZZ	J	SAW Matching Coil	AD
T1301	RCiLD0152CEZZ	J	Sound Detector Coil	AE
CERAMIC FILTERS				
CF1301	RFiLC0061CEZZ	J	5.5MHz Filter	AF
SF1201	RFiLC0110CEZZ	J	38.9MHz SAW Filter	AK
CAPACITORS				
C1205	VCEAGA1CW337M	J	330 16V Electrolytic	AC
C1208	VCE9AA1HW105M	J	1 50V Electrolytic (N.P)	AB

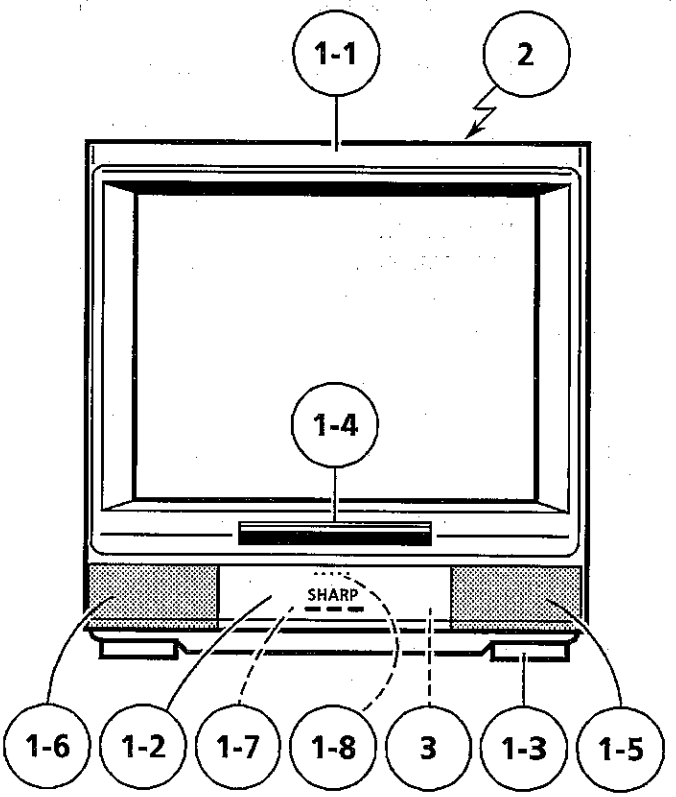
MISCELLANEOUS PARTS

⚠	QACCZ3003PEZZ	R	AC Cord	AQ
	VSP9050PB278A	R	Speaker (2 used)	AW

PACKING PARTS
(*NOT REPLACEMENT ITEM*)

SPAKC5531PEZZ	–	Packing Case	—
SPAKX0240PEZZ	–	Buffer Material	—
SPAKP0055PEZZ	–	Polystyrene Mat	—

CABINET PARTS LOCATION



SUPPLIED ACCESSORIES

ACCESSORIES				
	QANTR0014PEZZ	R	Rod Antenna	AV
	QPLGA0011GEZZ	J	AC Plug Adaptor	AF
	QTANJ0005PEZZ	R	Antenna Plug, 75—300 ohm	AM
	RRMCG0756CESA	R	Infrared Remote Controller	BA
ACCESSORIES (*NOT REPLACEMENT ITEM*)				
	UBATU1032CCN1	–	Dry Batteries, Size AAA (2 pcs)	—
	TiNS-4445PEZZ	–	Operation Manual	—
	TMAPC3739PEZZ	–	Service Map	—

CABINET PARTS

1	CCABA2109WEV2	R	Cabinet Ass'y, Front	BU
1-1	*Not Available*	–	Cabinet, Front	—
1-2	GDORF0105PESA	R	Door	AN
1-3	GLEGP9004PESA	R	Leg (2pcs used)	AG
1-4	GMADT0057PESA	R	Window	AL
1-5	HDECA0006PESA	R	Speaker Decoration (Right)	AG
1-6	HDECA0007PESA	R	Speaker Decoration (Left)	AG
1-7	HiNDP0086PESA	R	Indication Panel	AG
1-8	PKAi-0001PE00	R	Push Latch	AF
2	GCABB2106PEKA	R	Cabinet, Rear	BQ
3	JBTN-0018PEKA	R	Button, Stand-by	AE

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